EFFECTIVENESS OF VIDEO LESSONS IN SCIENCE LEARNING AMONG UPPER PRIMARY STUDENTS IN PERAMBALUR DISTRICT

Investigated by

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RESEARCH PROJECT

Submitted to

STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

CHENNAI – 600 006.

2023 - 2024

CERTIFICATE

This is to certify that the Research Project entitle **"EFFECTIVENESS OF VIDEO LESSONS IN SCIENCE LEARNING AMONG UPPER PRIMARY STUDENTS IN PERAMBALUR DISTRICT"** submitted to SCERT, Chennai – 6, is a record of original research work done by P.VARATHARAJ Senior Lecturer, DIET, Padalur, Perambalur District in the period of 2023-2024. This report has not done for the award of any degree/Diploma/fellowship of Seminar title to any candidate of any university or institution. Also certified that this research represents independent work on the part of the candidate.

Place: Padalur **Signature of the Principal**

Date:

DECLARATION

I hereby declared that the Research Project report entitled **"EFFECTIVENESS OF VIDEO LESSONS IN SCIENCE LEARNING AMONG UPPER PRIMARY STUDENTS IN PERAMBALUR DISTRICT"** is an original and independent work done by me and it has not formed the basis for any other programme, Research work (or) any award.

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ACKNOWLEDGEMENT

I hereby, thank Dr.N.LATHA Director of SCERT, Chennai – 6 who initiated the joint venture with SRPC. The process is endeavored continually by the Joint Directors of SCERT, who have been planning and guided us each step through conducting workshops at various level by SRPC that gives continuous guidance and counselling to enhance the research.

Moreover, I thank Mr.K.RAJHA, Principal, DIET, Padalur, Perambalur District who gave this valuable opportunity by recommending me to SCERT for this research project.

I express my heartfelt thanks to District Research Team (DRT) those who have helped me to finish this work from typing, administering the tool, data analysis and compiling the project.

The guidance and counselling given continually by State Research Project Committee is highly commendable.

I express my heartfelt thanks to one and all those who have helped me to finish this work from typing, administering the tool, data analysis and compiling the project.

Investigator

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INTRODUCTION

1.1 Waste management

Waste management (or waste disposal) includes the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process.

Waste can be solid, liquid, or gas and each type has different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological and household. In some cases, waste can pose a threat to human health. Waste is produced by human activity, for example, the extraction and processing of raw materials. Waste management is intended to reduce adverse effects of waste on human health, the environment or aesthetics.

Waste management practices are not uniform among countries (developed and developing nations); regions (urban and rural areas), and residential and industrial sectors can all take different approaches.

Proper management of waste is important for building sustainable and livable cities, but it remains a challenge for many developing countries and cities. Effective waste management is quite expensive, usually comprising 20%–50% of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable, and socially supported. In view of this, the World Bank finances and advises on solid waste management projects using a diverse suite of products and services, including traditional loans, results-based financing, development policy financing, and technical advisory. World Bank-financed waste

management projects usually address the entire lifecycle of waste right from the point of generation to collection and transportation, and finally treatment and disposal.

A large portion of waste management practices deal with municipal solid waste (MSW) which is the bulk of the waste that is created by household, industrial, and commercial activity

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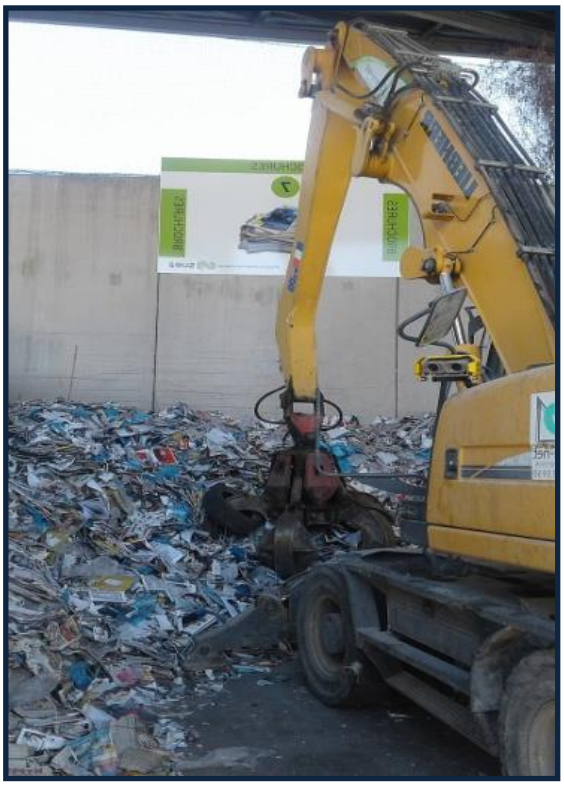


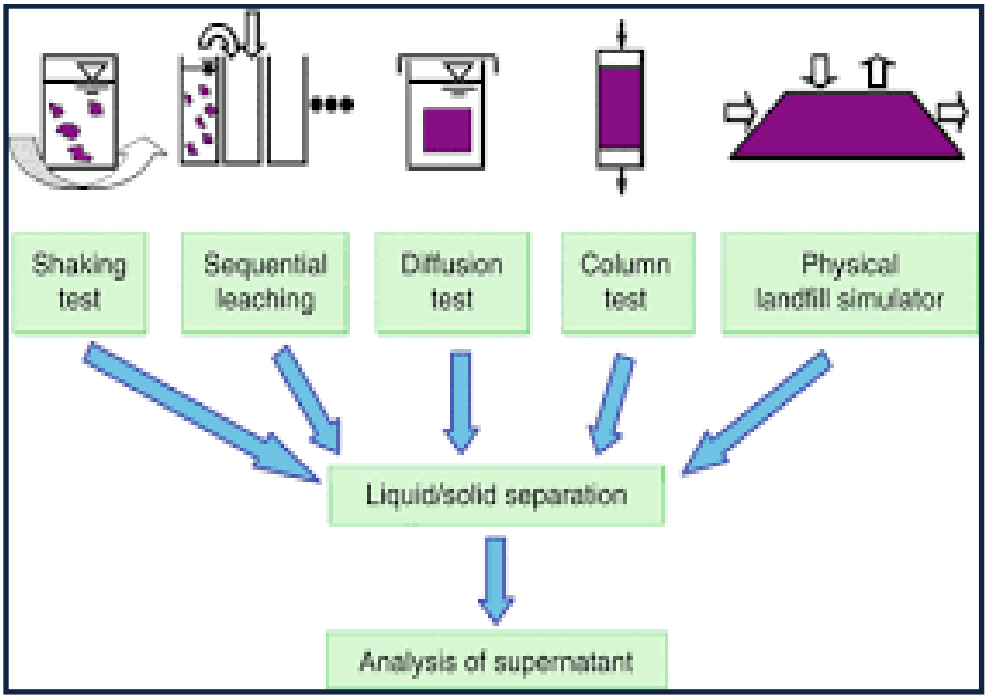
1.2 Components of waste management

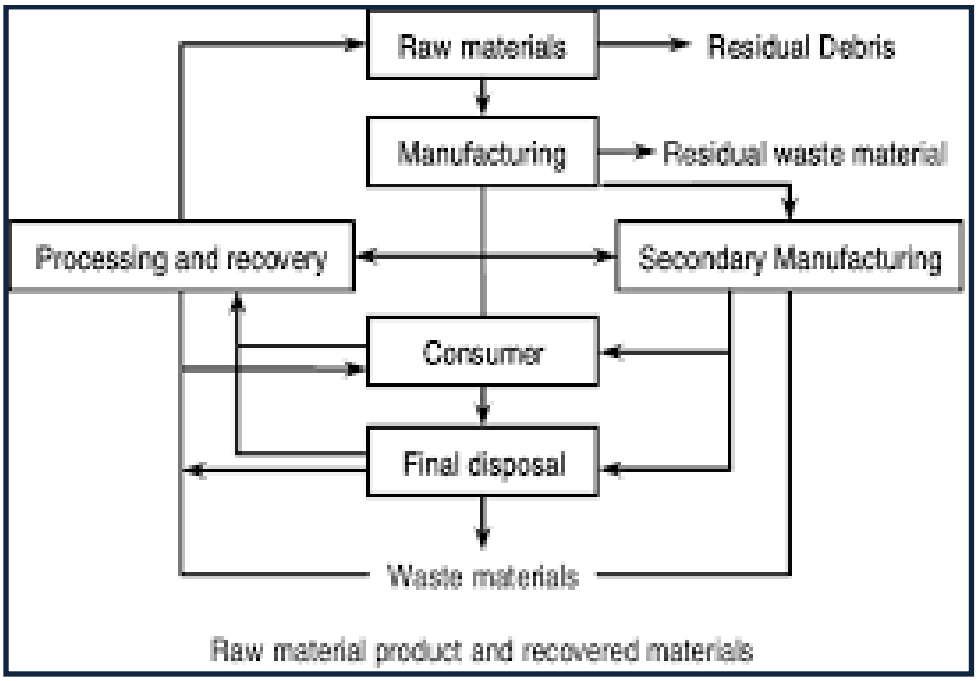
Solid waste management can be divided into five key components:

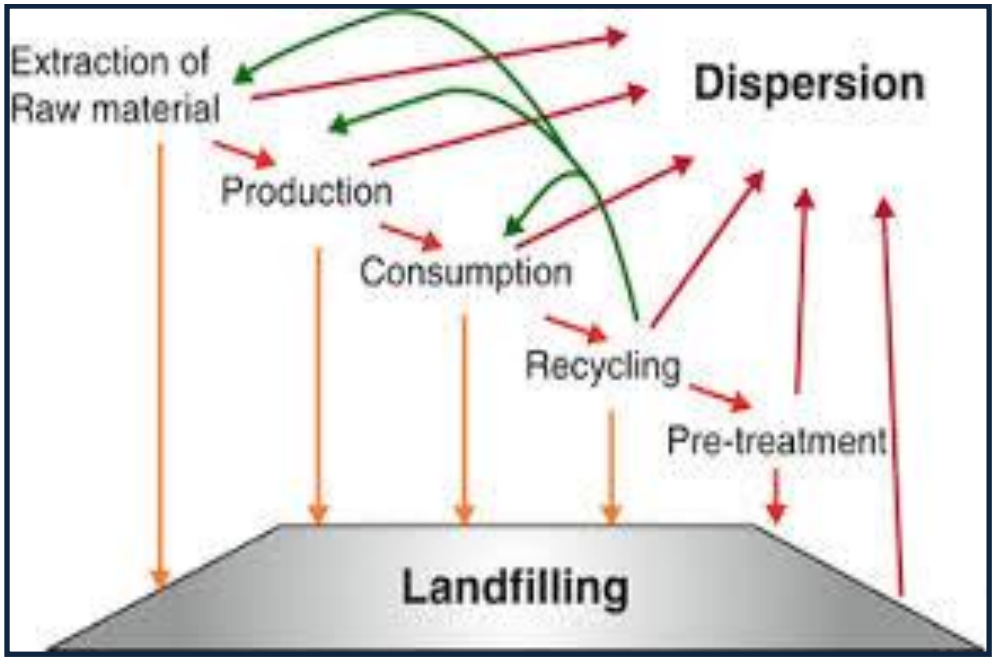
- Generation
- Storage
- Collection
- Transportation
- Disposal

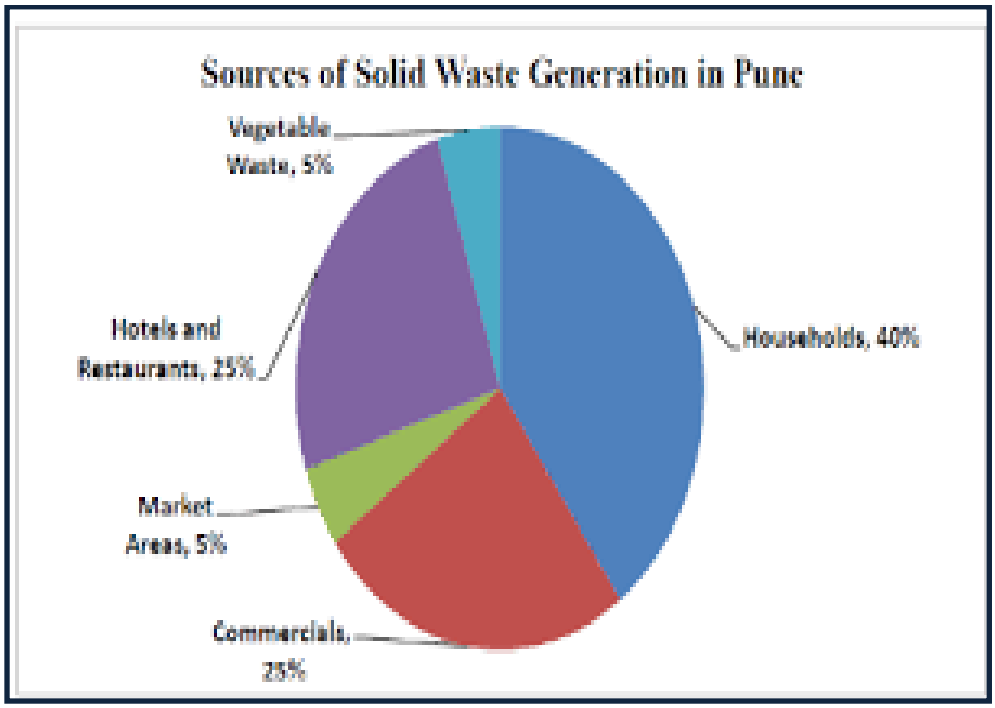
1.2.1 Generation

Generation of solid waste is the stage at which materials become valueless to the owner and since they have no use for them and require them no longer, they wish to get rid of them. Items which may be valueless to one individual may not necessarily be valueless to another. For example, waste items such as tins and cans may be highly sought after by young children.


Shaking test
Sequential leaching
Diffusion test
Column test
Physical landfill simulator
Liquid/solid separation
Analysis of supernatant

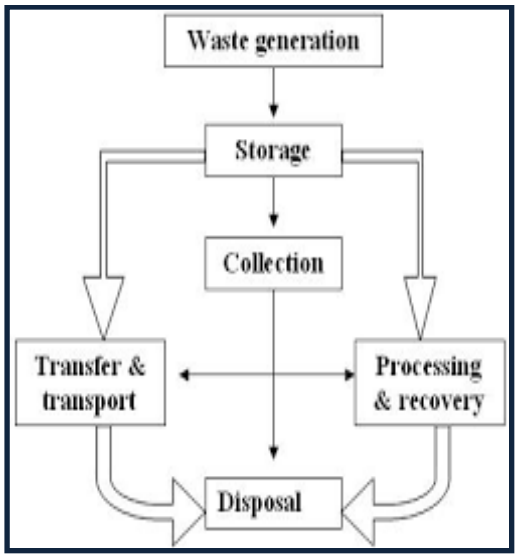

Raw materials
Residual Debris
Manufacturing
Residual waste material
Processing and recovery
Secondary Manufacturing
Consumer
Final disposal
Waste materials
Raw material product and recovered materials


Extraction of
Raw material
Dispersion
Production
Consumption
Recycling
Pre-treatment
Landfilling


Sources of Solid Waste Generation in Pune
Vegetable
Waste, 5%
Hotels and
Restaurants, 25%
Households, 40%
Market
Areas, 5%
Commercials,
25%

1.2.2 Storage

Storage is a system for keeping materials after they have been discarded and prior to collection and final disposal. Where on-site disposal systems are implemented, such as where people discard items directly into family pits, storage may not be necessary. In emergency situations, especially in the early stages, it is likely that the affected population will discard domestic waste in poorly defined heaps close to dwelling areas. If this is the case, improved disposal or storage facilities should be provided fairly quickly and these should be located where people are able to use them easily. Improved storage facilities include:



- Small containers: household containers, plastic bins, etc.
- Large containers: communal bins, oil drums, etc.
- Shallow pits
- Communal depots: walled or fenced-in areas

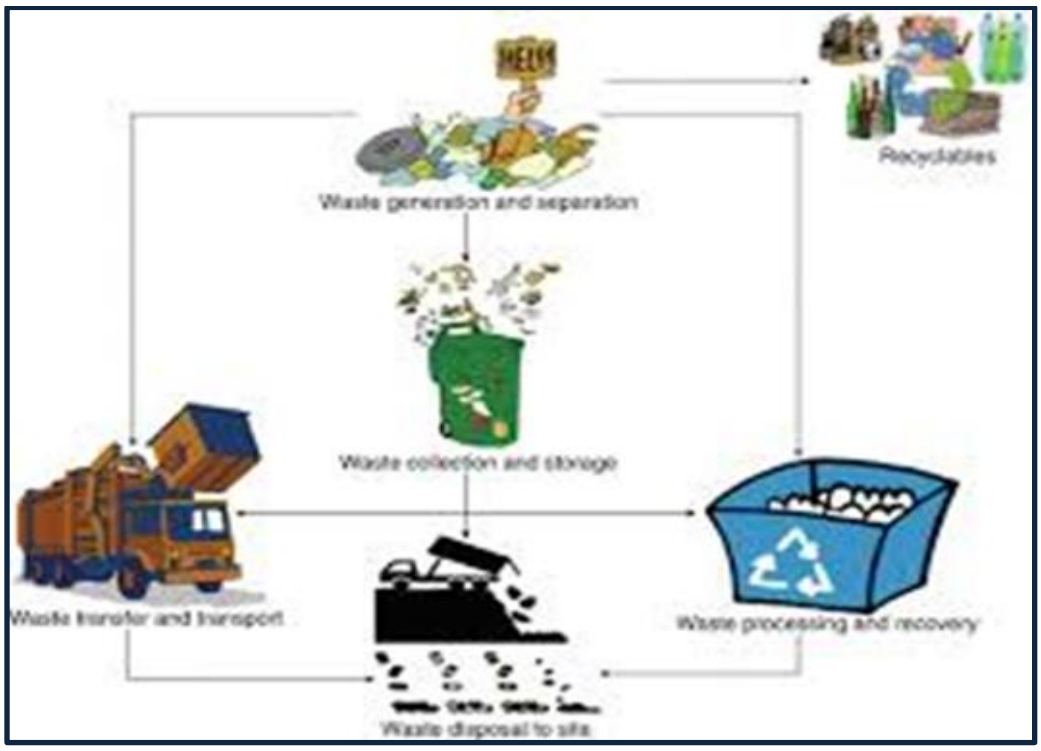
In determining the size, quantity and distribution of storage facilities the number of users, type of waste and maximum walking distance must be considered. The frequency of emptying must also be determined, and it should be ensured that all facilities are reasonably safe from theft or vandalism.

1.2.3 Collection

Collection simply refers to how waste is collected for transportation to the final disposal site. Any collection system should be carefully planned to ensure that storage facilities do not become overloaded. Collection intervals and volumes of collected waste must be estimated carefully.

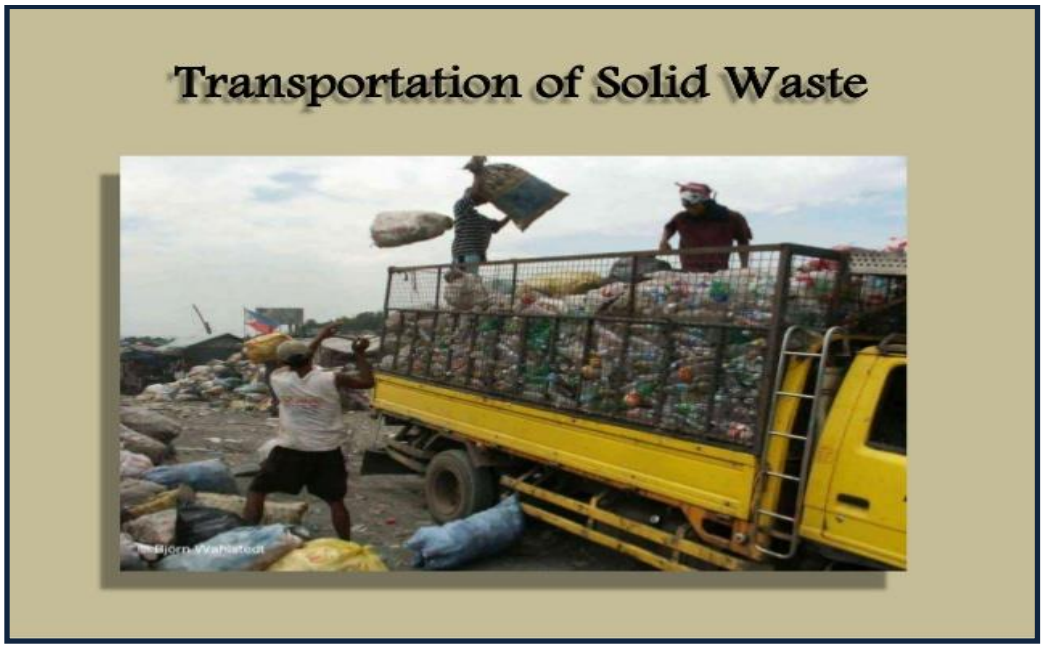

Transfer Station
Processing Plant
Landfill Site


Collection of solid wastes
• House-to-house collection
• Mechanical transport
• Dustless refuse collector



1.2.4 Transportation

This is the stage when solid waste is transported to the final disposal site (see 7.6 for more details). There are various modes of transport which may be adopted and the chosen method depends upon local availability and the volume of waste to be transported. Types of transportation can be divided into three categories:



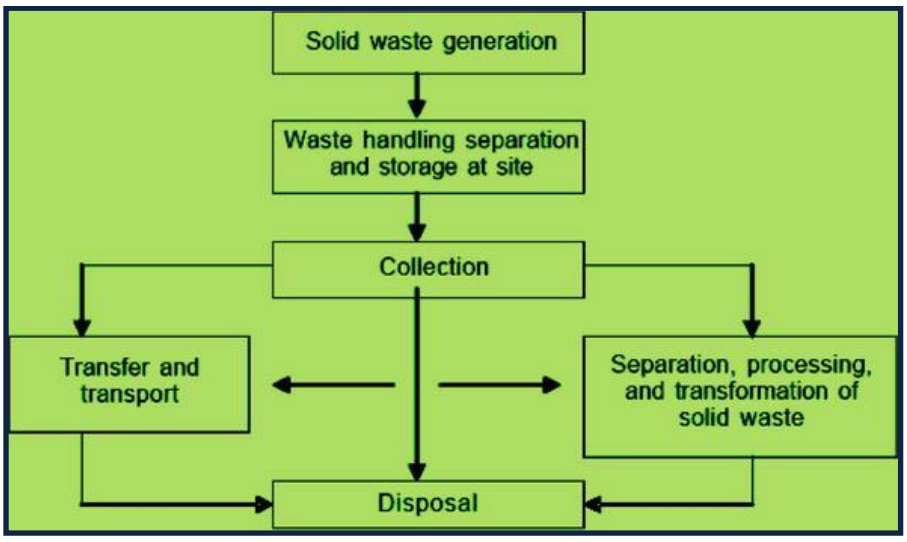
• Human-powered: open hand-cart, hand-cart with bins, wheelbarrow, tricycle

• Animal-powered: donkey-drawn cart

• Motorised: tractor and trailer, standard truck, tipper-truck

1.2.5 Disposal

The final stage of solid waste management is safe disposal where associated risks are minimised. There are four main methods for the disposal of solid waste:



• Land application: burial or landfilling

• Composting

• Burning or incineration

• Recycling (resource recovery)

1.3 Land Application: Burial or Landfilling

A landfill site, also known as a tip, dump, rubbish dump, garbage dump, or dumping ground, is a site for the disposal of waste materials. Landfill is the oldest and most common form of waste disposal, although the systematic burial of the waste with daily, intermediate and final covers only began in 1940s. In the past, refuse was simply left in piles or thrown into pits; in archeology this is known as a midden. Composting:

1.4 Composting

Compost is rich in nutrients. It is used, for example, in gardens, landscaping, horticulture, urban agriculture and organic farming. The compost itself is beneficial for the land in many ways, including as a soil conditioner, a fertilizer, addition of vital humus or humic acids, and as a natural pesticide for soil. Compost is useful for erosion control, land and stream reclamation, wetland construction, and as landfill cover.

Composting is an aerobic method (meaning that it requires the presence of air) of decomposing organic solid wastes. It can therefore be used to recycle organic material. The process involves decomposition of organic material into a humus-like material, known as compost, which is a good fertilizer for plants. Composting requires the following three components: human management, aerobic conditions, and development of internal biological heat.

Composting organisms require four equally important ingredients to work effectively:

1.5 Burning or incineration

Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. Incineration and other high-temperature waste treatment systems are described as "thermal treatment". Incineration of waste materials converts the waste into ash, flue gas and heat.

1.6 Recycling (resource recovery)

Recycling is a resource recovery practice that refers to the collection and reuse of disposed materials such as empty beverage containers. The materials from which the items are made can be reprocessed into new products

1.7 E-Waste management

E-waste or electronic waste is created when an electronic product is discarded after the end of its useful life. The rapid expansion of technology and the consumption driven society results in the creation of a very large amount of e-waste in every minute.

The European WEEE Directive classifies waste in ten categories: Large household appliances (including cooling and freezing appliances), Small household appliances, IT equipment (including monitors), Consumer electronics (including TVs), Lamps and Luminaires, Toys, Tools, Medical devices, Monitoring and control instruments and Automatic dispensers. These include used electronics which are destined for reuse, resale, salvage, recycling, or disposal as well as re-usables (working and repairable electronics) and secondary raw materials (copper, steel, plastic, etc.). The term "waste" is reserved for residue or material which is dumped by the buyer rather than recycled, including residue from reuse and recycling operations, because loads of surplus electronics are frequently commingled (good, recyclable, and non-recyclable). Several public policy advocates apply the term "e-waste" and "e-scrap" broadly to all surplus electronics. Cathode ray tubes (CRTs) are considered one of the hardest types to recycle.

On the other hand, the Partnership on Measuring ICT for Development defines e-waste into six categories, namely : (1) Temperature exchange equipment (e.g., air conditioners, freezers), (2) Screens, monitors (e.g., TV, laptop), (3) Lamps(e.g., LED lamps), (4) Large equipment (e.g., washing machines, electric stoves), (5) Small equipment (e.g., microwave, electric shaver), and (6) Small IT and telecommunication equipment (e.g., mobile phones, printers). Products in each category vary in longevity profile, impact, and collection methods, among other differences.

CRTs have a relatively high concentration of lead and phosphors (not to be confused with phosphorus), both of which are necessary for the display. The United States Environmental Protection Agency (EPA) includes discarded CRT monitors in its category of "hazardous household waste" but considers CRTs that have been set

aside for testing to be commodities if they are not discarded, speculatively accumulated, or left unprotected from weather and other damage. These CRT devices are often confused between the DLP Rear Projection TV, both of which have a different recycling process due to the materials of which they are composed.

The EU and its member states operate a system via the European Waste Catalogue (EWC) - a European Council Directive, which is interpreted into "member state law". In the UK, this is in the form of the List of Wastes Directive. However, the list (and EWC) gives a broad definition (EWC Code 16 02 13*) of what is hazardous electronic waste, requiring "waste operators" to employ the Hazardous Waste Regulations (Annex 1A, Annex 1B) for refined definition. Constituent materials in the waste also require assessment via the combination of Annex II and Annex III, again allowing operators to further determine whether a waste is hazardous.

Debate continues over the distinction between "commodity" and "waste" electronics definitions. Some exporters are accused of deliberately leaving difficult-to-recycle, obsolete, or non-repairable equipment mixed in loads of working equipment (though this may also come through ignorance, or to avoid more costly treatment processes). Protectionists may broaden the definition of "waste" electronics in order to protect domestic markets from working secondary equipment.

The high value of the computer recycling subset of electronic waste (working and reusable laptops, desktops, and components like RAM) can help pay the cost of transportation for a larger number of worthless pieces than what can be achieved with display devices, which have less (or negative) scrap value. In A 2011 report, "Ghana E-Waste Country Assessment", found that of 215,000 tons of electronics

imported to Ghana, 30% were brand new and 70% were used. Of the used product, the study concluded that 15% was not reused and was scrapped or discarded. This contrasts with published but uncredited claims that 80% of the imports into Ghana were being burned in primitive conditions.

1.8 Biodegradable Waste

Biodegradable waste includes any organic matter in waste which can be broken down into carbon dioxide, water, methane or simple organic molecules by micro-organisms and other living things by composting, aerobic digestion, anaerobic digestion or similar processes. In waste management, it also includes some inorganic materials which can be decomposed by bacteria. Such materials include gypsum and its products such as plasterboard and other simple organic sulfates which can decompose to yield hydrogen sulphide in anaerobic land-fill conditions.

In domestic waste collection, the scope of biodegradable waste may be narrowed to include only those degradable wastes capable of being handled in the local waste handling facilities.

Biodegradable waste can be found in municipal solid waste (sometimes called biodegradable municipal waste, or as green waste, food waste, paper waste and biodegradable plastics). Other biodegradable wastes include human waste, manure, sewage, sewage sludge and slaughterhouse waste. In the absence of oxygen, much of this waste will decay to methane by anaerobic digestion.

In many parts of the developed world, biodegradable waste is separated from the rest of the waste stream, either by separate curb-side collection or by waste sorting after collection. At the point of collection such waste is often referred to as green waste. Removing such waste from the rest of the waste stream substantially reduces waste volumes for disposal and also allows biodegradable waste to be composted.

In the UK, 7.4 million tonnes of biodegradable waste was sent to landfill in 2017 having reduced from 7.8 million tonnes in 2018.

Biodegradable waste can be used for composting or a resource for heat, electricity and fuel by means of incineration or anaerobic digestion. Swiss Kompogas and the Danish AIKAN process are examples of anaerobic digestion of biodegradable waste.[8][9] While incineration can recover the most energy, anaerobic digestion plants retain nutrients and make compost for soil amendment and still recover some of the contained energy in the form of biogas. Kompogas produced 27 million Kwh of electricity and biogas in 2009. The oldest of the company's lorries has achieved 1,000,000 kilometers driven with biogas from household waste in the last 15 years.

1.9 Non-Biodegradable Waste

What does Non-biodegradable mean?

1.9.1 Definition

A Non-Biodegradable material can be defined as a kind of substance which cannot be broken down by natural organisms and acts as a source of pollution.

Unlike biodegradable wastes, non-biodegradable cannot be easily handled. Non-biodegradable wastes are those who cannot be decomposed or dissolved by natural agents. They remain on earth for thousands of years without any degradation. Hence the threat caused by them is also more critical. A notable example is the

plastics which are a commonly used material in almost every field. To give these plastics a long lasting effect, improved quality plastics are being put to use. This made them more temperature resistant and more durable even after use. Other examples are cans, metals, and chemicals for agricultural and industrial purposes. They are the main causes of air, water and soil pollution and diseases like cancer.

Since non-biodegradable wastes are not Eco-friendly, they need to be replaced. As a part of a development of alternatives, scientists have brought forward many ides like biodegradable plastics, etc. They incorporated some biodegradable materials with plastics and made them easily and rapidly degradable. But this is quite an expensive procedure.

1.9.2 What is Non-Biodegradable waste?

Waste that cannot be decomposed by the biological processes is known as “Non-biodegradable wastes”. Most of the inorganic waste is non-biodegradable. Non-biodegradable wastes that can be recycled are known as “Recyclable waste” and those which cannot be recycled are known as “Non-recyclable waste”

1.9.3 Difference between Biodegradable and non-biodegradable

S.No	Biodegradable	Non-Biodegradable
1	Degradation process in Biodegradable waste is rapid	Degradation process in Non-Biodegradable waste is slow
2	Biodegradable waste is decomposed and degraded by microbes	Non-Biodegradable waste is cannot be decomposed by microbes
3	Biodegradable waste are not accumulated but are used up in a short time	Non-Biodegradable waste often accumulate
4	Biodegradable waste become part of biogeochemical cycles and give back rapid turnover	Most of the Non-Biodegradable waste never enter into biogeochemical cycles, very slow and toxic
5	Biodegradable waste are used to produce energy manure, compost and biogas	Non-Biodegradable waste can be separated and recycled but the process is very expensive

1.10 Waste to Energy Via Incineration

Incineration, the combustion of organic material such as waste with energy recovery, is the most common WtE implementation. All new WtE plants in OECD countries incinerating waste (residual MSW, commercial, industrial or RDF) must meet strict emission standards, including those on nitrogen oxides (NOx), sulphur dioxide (SO2), heavy metals and dioxins. Hence, modern incineration plants are vastly different from old types, some of which neither recovered energy nor materials. Modern incinerators reduce the volume of the original waste by 95-96 percent, depending upon composition and degree of recovery of materials such as metals from the ash for recycling.

Incinerators may emit fine particulate, heavy metals, trace dioxin and acid gas, even though these emissions are relatively low from modern incinerators. Other concerns include proper management of residues: toxic fly ash, which must be handled in hazardous waste disposal installation as well as incinerator bottom ash (IBA), which must be reused properly.

Critics argue that incinerators destroy valuable resources and they may reduce incentives for recycling. The question, however, is an open one, as European countries which recycle the most (up to 70%) also incinerate to avoid landfilling.
Incinerators have electric efficiencies of 14-28%. In order to avoid losing the rest of the energy, it can be used for e.g. district heating (cogeneration). The total efficiencies of cogeneration incinerators are typically higher than 80% (based on the lower heating value of the waste).

The method of incineration to convert municipal solid waste (MSW) is a relatively old method of WtE generation. Incineration generally entails burning waste (residual MSW, commercial, industrial and RDF) to boil water which powers

steam generators that generate electric energy and heat to be used in homes, businesses, institutions and industries. One problem associated is the potential for pollutants to enter the atmosphere with the flue gases from the boiler. These pollutants can be acidic and in the 1980s were reported to cause environmental degradation by turning rain into acid rain. Modern incinerators incorporate carefully engineered primary and secondary burn chambers, and controlled burners designed to burn completely with the lowest possible emissions, eliminating, in some cases, the need for lime scrubbers and electro-static precipitators on smokestacks.

By passing the smoke through the basic lime scrubbers, any acids that might be in the smoke are neutralized which prevents the acid from reaching the atmosphere and hurting the environment. Many other devices, such as fabric filters, reactors, and catalysts destroy or capture other regulated pollutants.According to the New York Times, modern incineration plants are so clean that "many times more dioxin is now released from home fireplaces and backyard barbecues than from incineration. " According to the German Environmental Ministry, "because of stringent regulations, waste incineration plants are no longer significant in terms of emissions of dioxins, dust, and heavy metals".

1.10.1. Activities

Activity 1: Observe the change

The students are instructed to watch carefully the activities and make keen observation and answer while discussions. The researcher bought and brought some amount of lime, sand, soil, turmeric powder and soap. They are spreaded over a table separately in a specific container. The students are informed don't shake the table and don't take the container which contain turmeric powder, lime water and soap water. The students are asked to form a queue and stand one by one with a required gap between each other student. The researcher told the students that he would call them

one by one and ask to do some work here, i.e., he would call one student to take a few drops of lime water and another student from another row to take a pinch of turmeric powder. There will be given a chance for doing the experiment to everyone. The two students those are called by me only do the experiments in front of other students. The rest of the students would keep quiet and make keen observation what was going on. The first student of first row called by the researcher and instructed to take some drops of lime water from the container in a plate. The other student from the another row was called by the researcher to take turmeric powder from the container in a separate plate.

The researcher instructed the student who had lime water in his plate and pour one or two drops of lime water with turmeric powder which was held by another student. He instructed the students to stir well the mixture, i.e. turmeric powder with lime water. The students were observed if there is any colour change of turmeric powder. Yes sir. They replied immediately. The yellow colour of the turmeric powder was changed to red colour. What is the reason? What happened? Lime water is a basic substance. It changed the colour of turmeric powder from yellow to red. OK! Go to your place. Then the researcher called the another one student from First row and another student from the second row. The students were instructed to take another substance, i.e. soil water from the container and other student was informed to take some amount of turmeric powder and informed to mix each other, i.e. turmeric powder and soil water had to be mixed each other very well. The Researcher asked the students have you seen any colour change of turmeric powder. They replied immediately, NO sir. There was no colour change in turmeric powder because soil water is not a basic substance. So, it won't change the colour of turmeric powder. Then the students were understood very well that any substance which make a colour change with other substance is known as basic or acids. Hence turmeric powder was changed from yellow to Red by lime water only not by soil water. now the students were understood very well the properties of bases.

Activity 2: Difference between acid and base

There are three different types of tests available and suitable to distinguish acids from bases. They are:

1. pH paper test
2. Litmus Paper Test
3. Indicator test

Now the researcher asked the students to observe carefully his instructions. The researcher bought and brought blue Litmus Paper and red litmus paper separately. They were spreaded over the table separately. The researcher called on a student from first row and told to take some drops of dilute Hydrochloric Acidfrom the bottle with the help of a dropper. The student was asked to pour the acid in a strip of blue Litmus Paper drop by drop. The researcher asked the students, “Was any colour change of the Litmus Paper from Blue to any other colour?” They were replied usually Yes sir, blue colour was changed into red colour. Well done students. You have observed clearly right now. The researcher took a strip of red litmus paper and dipped it into the dilute Hydrochloric Acid. The students were asked “Was any colour change have you seen the red Litmus paper from red to any other colour?”They replied suddenly No sir, There was no change in the colour of red litmus paper. it remained as such as red. Ok well done students. You were observed clearly. What is the reason? Why the colour was changed blue to Red but not red to any other colour. It is because the character of the acid is a reason. Any acid can change blue Litmus Paper into red colour but any substance which is basic in nature it could not change blue Litmus into any other colour. At the same time basic substance could not change the colour of red litmus paper into any other colour. So it was remained as such red in colour.

The same experiment was done by using lemon, grapes and tamarind. The above said natural substances contain various acids. So, they reacted with blue Litmus paper and changed the blue colour of blue Litmus into red colour.

Activity 3: Defects of plastics

The students were asked what are the defects of plastics. All of you know? No sir. We don't know the defects of plastics. The researcher prepared a video which explains the disadvantages of Plastic to human and other living things. He displayed the video and interacted with the students. After the presentation of the video the students could be able to answer some questions asked by the researcher.

Video link for water pollution:

https://drive.google.com/file/d/1z5vhVZ2xJUvJ6MK2iOTNfqJRBQ85pesK/view?usp=sharing

1.11. NEED AND SIGNIFICANCE OF THE STUDY

Science is a dynamic, expanding body of knowledge covering ever new domains of experience. According to contact, and eminent scientist and an educator, science is an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observation and are fruitful to further experimentation and observation. “Science education must focus on the quality of teaching and learning. The quality of the results, as a concept borrowed from the business sector which is much less complex and interactive than the education sector, is difficulty to define with precision, since it combine values, attitudes and achievements which from a part of the most complex areas of study in psychology, at various areas. Later on emerges the socio-congnitive theory which proposed that both behavior and environment equally contribute to learning. Mind is not just a reactant to neutral event but rather an active component that can conceive an idea, rethink over the same idea, can function as the evaluator and executor of ideas depending on the person whose mind it belongs, situation and social setting.

1.12 OBJECTIVES

- To identify the level of awareness of students on waste management.
- To identify the classification of wastes.
- To utilize the waste, which are sorted out separately in a proper way.
- To develop some innovative practices to improve awareness on waste management .
- To understand the innovative practices to improve the awareness on waste management among upper primary students.
- To find out the effectiveness of improving awareness on waste management among upper primary students.

1.13. METHODOLOGY

Methodology involves the procedure adopted for the realization of objectives of the study for the study, both survey and experimental methods were used using survey method the existing level of scientific Temper of upper Primary level Students was identified. The data was collected randomly from 250 upper primary level students using Questionnaire which has 20 objective type questions.

Experimental method was used for testing the awareness on waste management among upper primary level students. Before starting this method, pre-test was conducted by the investigator to identify the training needed students to improve awareness on waste management. After that the students those are needed training are divided into two groups. One group is known as control group and another one is known as experimental group. The control group was treated by traditional method and the experimental group was executed through ICT. After the treatment all the tests given as pretests were administered again to both the groups as post-tests.

The major statistical Techniques used for the study were the following:

1.Descriptive Analysis

a) Mean b) Median c) Standard deviation

2.Differential Analysis

a) t-test

1.14. HYPOTHESES

1. There is no significant difference in the existing level of Awareness on Waste Management of upper primary students based on the type of school.
2. There is no significant difference between the scores of pre-test and post-test of the control group of Govt.High School.
3. There is no significant difference between the score of pre-test and post-test of experimental group of Govt.High.School.
4. There is no significant difference between the mean score of the pre-test and post-test of the Control group of Govt.Hr.Sec.School.
5. There is no significant difference between the mean score of the pre-test and post-test of the experimental group of Govt.Hr.Sec.School.
6. There is no significant difference between the mean score of the post-test of Boys and Girls of Experimental group.

1.15 LIMITATIONS OF THE STUDY

- This study covers only in Perambalur Dt.
- Experimental method was adopted as methodology to this study. So, all the school could not be included into this study.
- Due to some technical difficulty, many schools were excluded.

1.16. ORGANIZATION OF THE RESEARCH

The Chapter I present a systematic introduction of the research problem, need and significance of the study, statement of the problem, operational definitions of the key words, objectives of the study, methodology and limitations of the study. Chapter II deals with the review of related literature in the light of the present study. Chapter III deals with the methods and procedures of the research applied rot the present investigation. Chapter IV presents the analysis and interpretation of data. Chapter V summarizes the findings, suggestions and conclusion.

CHAPTER - II

REVIEW OF RELATED LITERATURE

2.1. INTRODUCTION

Research takes advantage of the knowledge which has accumulated in the past as a result of constant human endeavor. It can never be undertaken in isolation of the work that has already been done on the problems which are directly or indirectly related to a study proposed by a researcher. A careful review of the research journal, books, dissertation, these and other sources of information on the problem to be investigated is one of the important steps in the planning of any research study.

Review of Literature is a comprehensive survey of the works; which aims to review the critical points of current knowledge published in a field of study, or related to a particular topic of research, usually in the form of a bibliographic essay or annotated list of references is which attention is drawn to the most significant works. In scholarly journals that publish original research, the first section of each article is usually devoted to a review of the previously published literature on the subject, with references in the text to a list of works cited at the end. Literature review is a conceptually organized combination of a literature search results that provides a context for the research. It is neither a summary of the literature, nor merely description of the works, but it is a critical piece of information. It involves thorough study and analysis of available literature on the problem under study. Literature review helps the researchers to refine ideas, know specifications of research procedure, adds to the clarity and understanding of things to be done during research (Dellinger,2005).

Literature Review is important in:

a. Supporting the identification of a research topic, questions or hypothesis.
b. Identifying the literature so that the researches will be able to contribute more and contextualizing the research with in that literature.
c. Building an understanding of theoretical concepts and terminology.
d. Facilitating the building of a bibliography.
e. Suggesting research methods that might be useful
f. Analyzing and interpreting results (Shastri, 2008).

In the present chapter, the literature review and studies in close proximity to the present study have been discussed. An attempt has been made here to review the researchers that have been done in India and abroad. The points emerging from the review of the related literature have also been objectively discussed.

2.2 Solid Waste Management (SWM)

Solid waste management has become one of a major concern in environmental issues (Mazzanti & Zoboli, 2008). This is particularly true to urban areas where population is rapidly growing and amount of waste generated is increasing like never before (Kathiravale & Mohd Yunus, 2008). Current earth's population is 6.8 billion and it is estimated that almost half of this population lives in urban areas (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, 2009). Waste generation increase proportionally to this population number and income, creating the needs of effective management (Mazzanti & Zoboli, 2008). Urbanization and industrialization leads to new lifestyles and behavior which also affects waste composition from mainly organic to synthetic material that last longer such as plastics and other packaging material (Idris et al., 2004). E-waste that barely existed before was generated as much as 20-50 metric tons a year (UNEP, 2006).

The management of waste become complex and the facilities provided cannot cope with the increasing demand and needs. Therefore, best approach need to be implemented immediately while considering environmental, social and economic aspects (Aye & Widjaya, 2006). The drivers of sustainable waste management were clarified by Agamuthu et al. (2009), which include human, economic, institutional and environment aspect. The study suggests that each driving group should be considered in local context as managing solid waste for a particular society may differ from the others.

For example, waste managers in Africa need to tackle some issues including, lack of data, insignificant financial resources, vast different of amount and waste types between urban and rural area, lack of technical and human resources, low level of awareness and cultural aversion towards waste (Couth & Trois, 2010). On the other hand, problems faced among Asian countries differ with two distinct groups; developed and developing countries. While some of the countries are having specific national policy on solid waste management, some others experience problems such as increasing urban population, scarcity of land, services coverage area, inadequate resources and technology, and so on (Shekdar, 2009).

The differences in managing solid waste not only vary between countries but also among areas in the same country. For instance, while Istanbul are having big improvement in their solid waste management with the establishment of transfer stations, sanitary landfills and methane recovery system, it does not reduce the problem in the Black Sea coast in Turkey. This is caused by the complex topography, weak administrative structures and the low local's income (Berkun et al., 2005).

Integrated Sustainable Waste Management (ISWM) system was then introduced in 1995 to improve earlier system that neglect unique characteristics of a given society, economy and environment (van de Klundert, 1999). For example, European countries had applied various system assessment tools and engineering models to create sustainable communities, manage resources efficiently, tapping innovation potential of the economy, ensuring prosperity, environmental protection and social cohesion in their SWM system (Pires et al., 2011). Asian countries had also given attention in building the national lega.

2.3 Solid Waste Generation

Waste generation is the most important aspect to look at in order to have effective solid waste management system. The generation of waste varies considerably between countries based on the culture, public awareness and management (Hazra & Goel, 2009; Wagner & Arnold, 2008; Magrinho et al., 2006).

Generally, developed countries generate more waste than developing countries (Kathiravale & Mohd Yunus, 2008). Countries in Asian and African region produce waste in the range of 0.21-0.37 tons/ capita/ year, while European countries generate higher amount of waste with 0.38-0.64 tons/ capita/ year (Intergovernmental Panel on Climate Change [IPCC], 2006).

The generation of waste is also reported to be associated with the economic status of a country. In Asia, countries with higher GDP, namely Hong Kong and Japan were reported to generate more waste compared to developing countries such as India, Vietnam and Nepal (Table 2.1) (Shekdar, 2009).

Developed countries are experiencing high waste generation while developing countries always have problems with the implementation of the management system (Hazra & Goel, 2009; Bai & Sutanto, 2002). This includes weak enforcement, lack of technology and ineffective policy implementation (Agamuthu et al., 2009). In detail, these countries experience low and irregular collection of waste, uncontrolled of air and water pollution in open dumping area, the breeding of flies and vermin, and the mismanagement of scavenging activities (Latifah et al., 2009).

Looking at the waste generation trend of developed country, it is believed that other transition and developing countries will experienced the same. Until recently, the generation of waste is increasing and it is believed to continue rising. This is an issue of concern for authorities all over the world. It is believed that the amount of waste will continue to pile up the landfill and someday the land will not be able to receive anymore waste.

2.4 Solid Waste Disposal

Information on waste generation is important to determine the most suitable waste disposal options. Improper waste disposal may cause pollution. The main purpose in implementing best practice for solid waste management is to prevent pollution. Pollution is a threat to human and other living organism (Morra et al., 2009; Liu & Morton, 1998). It may also damage the ecosystem and disrupt the natural cycle and climate on earth (Raga et al., 2001). There are many disposal options available to suit the nature of waste and a country's preference and interest.

Economics and environmental aspects of waste disposal option are always the main issue in choosing the right technology (Aye & Widjaya, 2006; Daskalopoulos et al., 1997). Developed Asian countries such as Japan, South Korea and Singapore are

on their way to eliminate landfilling while some other Asian countries still have problems with open dumping (Agamuthu & Fauziah, 2010; Shekdar, 2009; Bai & Sutanto, 2002).

Despite the development of many waste disposal option, landfills remain the most prominent system applied worldwide (Shekdar, 2009; Hamer, 2003). Although a lot of improvement had been possible in the landfilling system and the regulation on the type of waste that can be treated at landfill is stringent, most of landfills operated remain primitive (Hamer, 2003).

Ayomoh et al. (2008) had listed few problems related to improper landfill operation including, health deterioration, accidents, flood occurrences, pollution of surface and underground waters, unpleasant odor, pest infestation and gas explosion. Although the impacts from landfills are known, impacts from other alternative remain unanswered thus subject to critics (Hamer, 2003).

2.5 Energy Via Incineration

Incineration has been the choice for developed country as they have sufficient financial input and are looking into energy recovery from waste (Papageorgiou et al., 2009; Kleiss & Imura, 2006). Small country such as Singapore adopts incineration as their waste disposal option due to scarcity of land (Bai & Sutanto, 2002). Even that, incineration is also associated with some other risks. This includes the generation of carcinogenic and toxic compound. It will also produce end products which need further treatment where it is highly toxic, collectively known as dioxin (Hamer, 2003).

Some reported that the impacts from incineration are over-emphasized and the advancing technology had highly reduced the environmental impacts (Morselli et al., 2008; Hamer, 2003). However, many of the countries prefer waste minimization compared to waste treatment such as landfill or incineration (Bai & Sutanto, 2002; Boyle, 2000). Technology is advancing every day and chemical recycling of plastic wastes has also been made possible in these developed countries (Al-Salem et al., 2009).

Other tools used to determine best waste disposal option includes multiple criteria analysis (MCA) and Cost-Benefit Analysis (CBA) (Chung and Poon, 1996). A SWPlan software particularly to calculate capital and management cost is also available to determine the best integrated technology in waste management (Fauziah & Agamuthu, 2007). 0.88 and 1.44 kg/ day depending on the rate of urbanization (Idris et al., 2004). Also, the amount of waste generated depends on the economic status of the inhabitants of the particular area (Agamuthu et al., 2009; Idris et al., 2004).

2.6 Dumping

River dumping usually involved waste from riverside houses, urban runoffs and storm drains. Ocean dumping includes materials such as demolition debris, sewage sludge, dredge materials, waste chemical and also garbage ("Ocean dumping", 2011). Most of the dumping activities are illegal while some are controlled and regulated.

Ocean dumping was a common practice before countries over the globe began to ban the activities in 1980s (Zou, 2009; Duxbury et al., 2000). Even after the prohibition, dumping into water bodies persist in the area where waste collection service is not received (Inanc et al., 2004).

In some regions, although there are designated dumping areas for slaughterhouse, hazardous and biomedical waste, the legislation are ineffective to curb illegal dumping onto water bodies (Inanc et al., 2004). To make it worse, waste previously dumped from ports and waterways had found their way back to the beaches years after the implementation of the legislation on ocean dumping (Duxbury et al., 2000).

Although direct dumping is prohibited, it was found that 80% of the total debris found in the river and ocean sourced from land-based activities ("Plastic debris: Rivers to sea", 2011). The amount of waste found on marine ecosystem can be minimized by controlling the amount of land-based charges ("Plastic debris: Rivers to sea", 2011). The management of solid waste on land will have impact to marine ecosystem, thus the understanding of the relationship is required to control marine pollution.

CHAPTER - III

METHODOLOGY

3.1 INTRODUCTION

This chapter deals with the description of research design and procedure. The research is the plan, structure and strategy of answer to research questions and to control the variance. (karlinger, 1964). The design gives the way to achieve and how the work is to be executed. Methodology occupies an important place in any kind of research. Methodology refers to the way the study is conducted. It is pointed out that the success of any research largely depends on the suitability of the methods, tools and techniques used to collect reliable and valid data. So in this content this chapter explain design of the study, size of the sample and how they one subjected as variables, the source and techniques of gathering data and so on.

3.2 RESEARCH METHODS APPLIED FOR THE PRESENT STUDY

According to Ebel (1980) appropriate tasks for survey research on to identify common problems to learn about circumstances associated with those problems, discover what seems generally effective in solving these problems.

The necessary data for the study was collected through survey as well as experimental method. Survey technique is used to find out the representative sample for experimentation. Based on the survey analysis, the experimental group was identified. Experimental method was adopted in this part of the study.

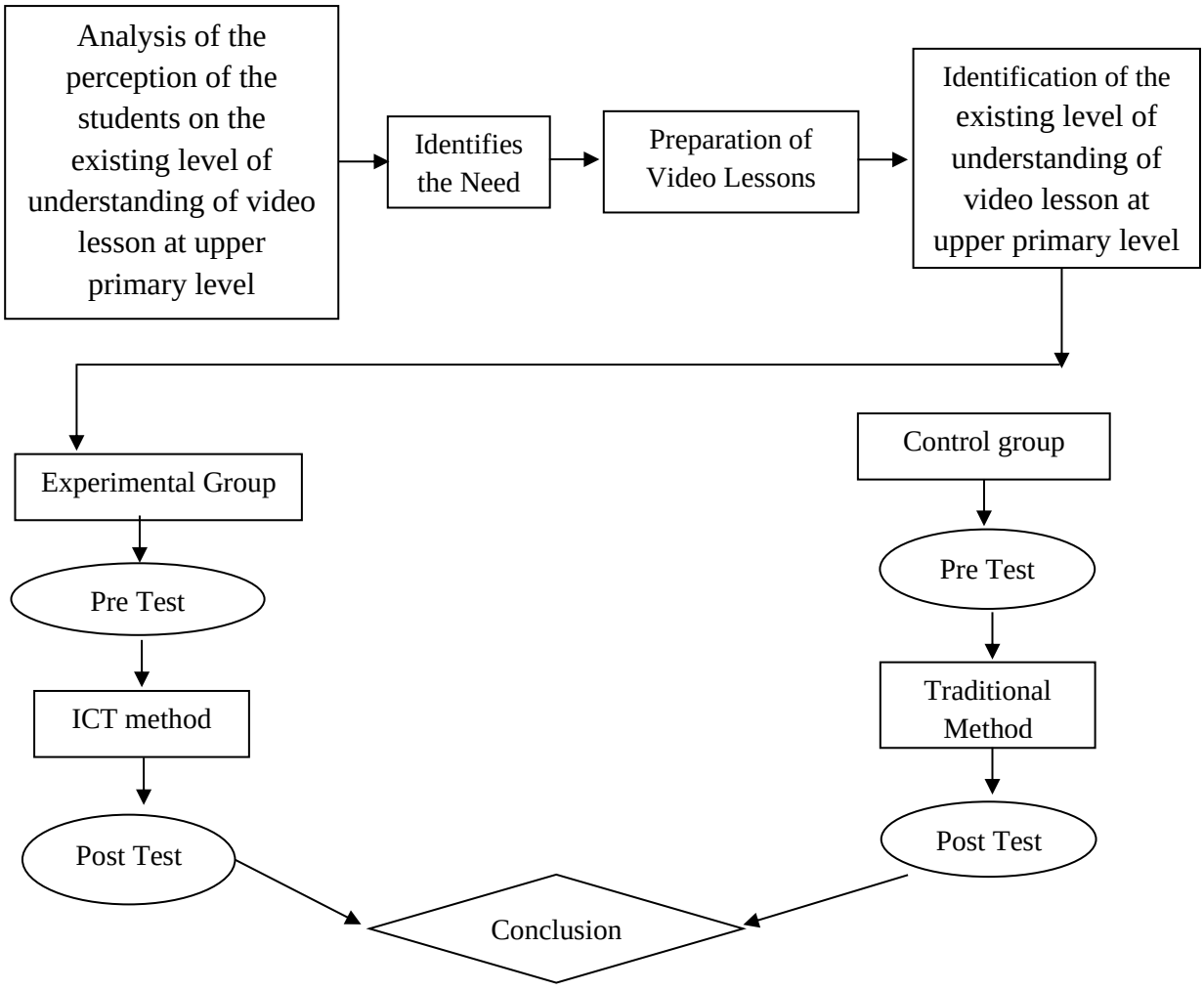
3.3 RESEARCH DESIGN

Heppner (1992) describes " a research design as a plan or structure for an investigation or list of specifications and procedure for conducting and controlling a research project". In other words, it can be described as a master plan which

indicates the strategies for conducting a research. A research design serves as a master plan for the methods and procedures that should be used to collect and analyze data needed by the investigator.

According to Claire salting (1962) “research design is a deliberately planned. arrangement of conditions for the analysis and collection of data in a manner that aims to combine relevance to the research purpose with economy in procedure”.

This study targets with improving awareness on waste management among upper primary students in Perambalur District. The following figure 3.1 shows the key components of the research procedure for the present study.



3.4 SAMPLE

Sampling for the present study is done two phases as the study involves survey and experimental methods. For the initial survey, a sample of 312 students were selected from four blocks of Perambalur District. This was used to identify the existing level of Waste Management Awareness among them. After identification f the training needed, the sample was Fifty Eight students of standard VIII from two schools.

1.GHSS. Veppanthattai	:	26
2.GHS Velur	:	32
Total	:	58

3.5 INSTRUMENTATION

3.5.1 SELECTION OF THE TOOL

According to John. W.Best (1969), “like the tools in a carpenter’s box each research tool is appropriate in a given situation to accomplish a particular purpose”.

Cane (1972) absented “the subways will involve questionnaire interview as consultations. They will establish what is happening and people will think “. The investigator prepared questionnaire. This questionnaire was used as a tool, It has 20 objective type of question.

3.5.2 SCORING PROCEDURE

The questionnaire consists of Twenty objective questions with three point scale. Each and every question has three options for answers, only one answers, is correct. The other two option are wrong.

For identification of the existing level of Awareness on Waste Management among upper primary students. The training needed sample have to be selected. It the total percentage of the school is very low , it will be selected as sample (ie) training needed sample is divided into two groups , it control group , it was taught with traditional method. Another one is experimental group , it was thought with ICT methods.

3.5.3 VALIDATION OF THE TOOL

The test was developed by the investigator the developed tool was given to the experts in the field of educational research. suggestions given by them were incorporated and some of the items were restructured and corrected. The finalized questionnaire was subjected to review by the experts.

3.5.4 ADMINISTERING THE TOOL

The investigator himself administered the tool for the collection of data regarding the improving awareness on waste management among the Upper Primary Students, in Perambalur District.

3.5.5 CONCLUSION

Thus the present chapter has presented a detailed description of the methods and procedure followed in the research. The data obtained through the study were subjected to analysis and interpretation. A detailed description of the analysis of the data along with appropriate discussions is given in the next chapter.

CHAPTER - IV

ANALYSIS AND INTERPRETATION OF DATA

4.1. INTRODUCTION

Analysis of the collected data is a vital Component of any research work. Without analysis this provides a deeper insight into its basic nature of the adequate description of a phenomenon is relatively impossible. An analysis of data means studying the original material in order to discover inherent facts. An analysis requires an alert, flexible and open mind it is worthwhile to prepare a plan of analysis before the actual collection of data.

The major objective of this was to improve awareness on waste management at upper primary level. The study included both survey and experimental method. Survey method was used to find out the level of students on the existing level of awareness on waste management at upper primary level. The data collected were subjected to necessary statistical analysis. The investigator adopted the experimental method to improve awareness on waste management among the Students through ICT at upper primary level.

4.2 DESCRIPTIVE ANALYSIS

Descriptive statistical procedures were used to describe different aspect of the data. The collected data were subjected to simple percentage analysis. Selinger (1989) Percentage and frequencies are used to indicate how often a phenomenon occurs and they are based on counting the number of occurrences. Such information is very useful in all researches.

TABLE 4.1: NATURE OF WASTE MANAGEMENT SCORES OF UPPER PRIMARY SCHOOL STUDENTS.

Sl.No	Name of School	Frequency Responses			
		Training Not Needed		Training Needed	
1	GHS Velur	12	40 %	18	60 %
2	GHS, Ladapuram	12	37.5%	20	62.5 %
3	GHSS Maruvathur	10	38.5%	16	61.5 %
4	GHSS, Kunnam	18	45 %	22	55 %
5	GHSS, Veppanthattai	12	40 %	18	60 %
6	GHSS, Arumbavur	16	50 %	16	50 %
7	GHSS, Padalur	14	41.2 %	20	58.8 %
8	GHSS Chettikulam	10	38.5 %	16	61.5 %

As shown in the table 4.1 that the existing level of Awareness on Waste Management among Upper Primary students is average. It is very clear from the following figure 4.1.

Figure 4.1

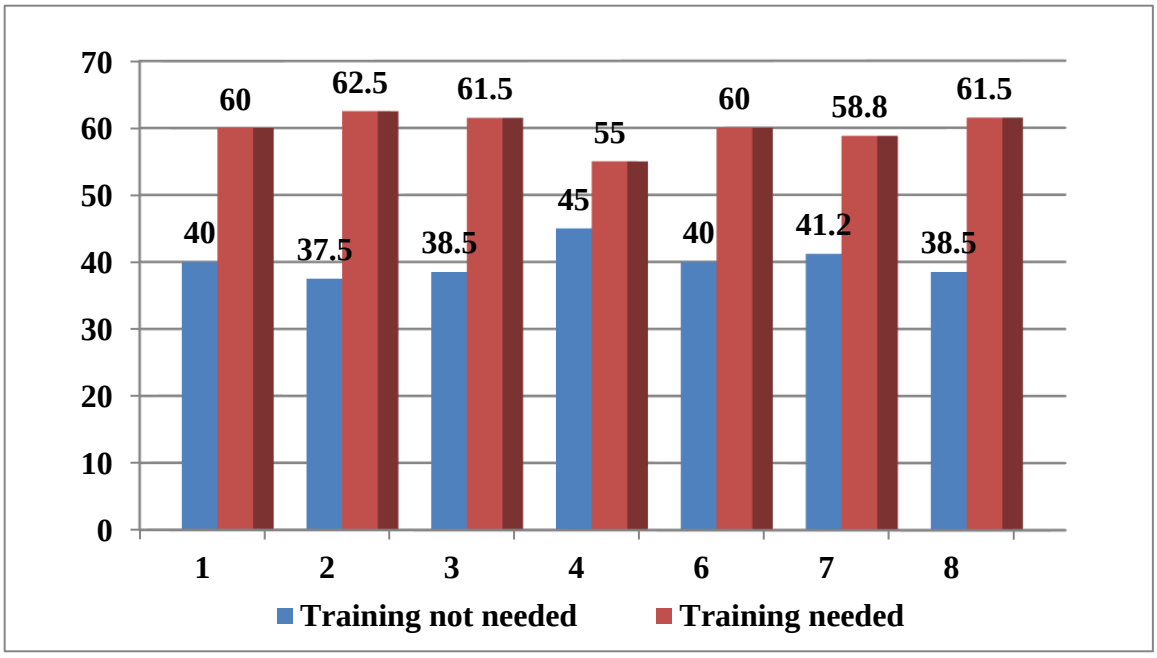


Table 4.2

Statistical analysis for the existing level of students on Waste Management Awareness based on the components.

Sl.No	Components	Training Not needed		Training Needed	
		Response	%	Response	%
1	Generation	20	8	31	12.4
2	Transportation	18	7.2	33	13.2
3	Disposal	23	9.2	28	11.2
4	Collection	25	10	27	10.8
5	Produce energy via Incineration	18	7.2	27	10.8
		104	41.6 %	146	58.4 %

Percentage of frequency Response for Training Needed = 58.4%

% of frequency Response for Training Not Needed = 41.6%

Figure: 4.2

Statistical analysis for the existing level of students on Waste Management Awareness based on the components.

4.3 DIFFERENTIAL ANALYSIS

Table 4.3

Significant of difference between the mean scores of the pre-test and post-test of the control Group of Govt.High School.

Types of Tests	N	M	S.D	't' Value	Remark
Pre-test	16	10.62	0.957	44.39	Significant
Post-test	16	13.56	1.153		

From the above Table 4.3 it is observed that the mean score of pretest 10.625 with standard deviation 0.957 and the mean score of post-test of control group of Govt. High school is 13.562 with standard deviation 1.153. The t-value obtained for difference between mean scores of pretest and post-test of control group of Govt. High School is 44.39. It is concluded that there is a significant value between pretest and post-test.

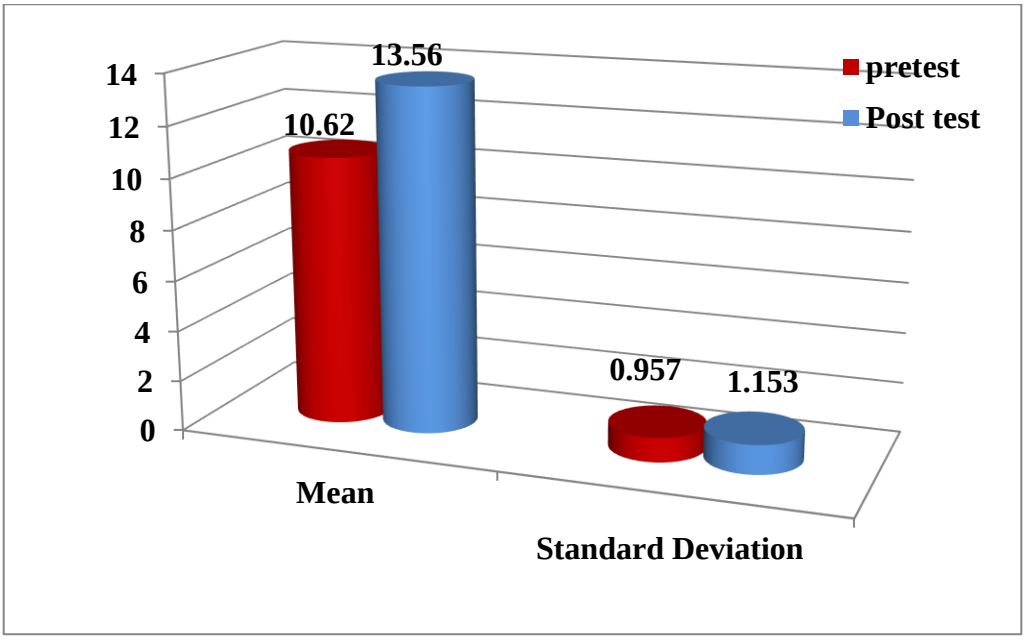


Figure 4.3 shows the significant difference between the pretest and post-test of control group of High School.

Table 4.4

Significance of difference between the mean scores of the pre-test and post-test of the Experimental Group of Govt. High School.

Types of Tests	N	M	S.D	't' Value	Remark
Pre-test	16	11.31	1.195	73.68	Significant
Post-test	16	18.68	1.014		

From the above Table 4.4, it is observed that the mean score of pretest of experimental group of Govt. High School is 11.31 with standard deviation 1.195 and the mean score post-test of experimental group is 18.68 with standard deviation 1.014. The t-value obtained the difference between the pretest and post-test of experimental group is 73.68. It is concluded that there is a significant between pretest and post-test of experimental group.

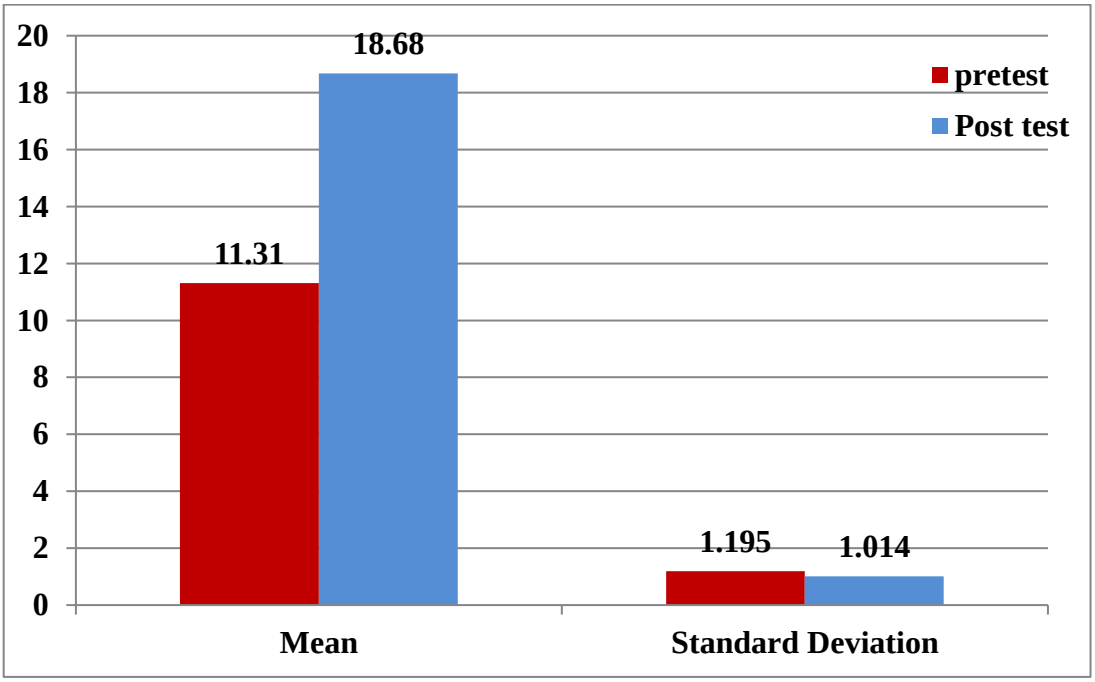


Figure 4.4 Significant of difference between the mean scores of the pre-test and post-test of the experimental group of Govt. High School.

Table 4.5

Significance of difference between the mean scores of the pre-test and post-test of the Control Group of Govt. Hr. Sec. School.

Type of Test	N	M	SD	't' Value	Remark
Pre-test	13	10.23	1.535	24.017	Significant
Post-test	13	17.15	2.339		

From the above table 4.5, it is observed that the mean scores of pretest of control group of GHSS, is 10.23 with standard deviation 1.535 and mean score of pre-test is 17.15 with standard deviation 2.339. The t-value obtained is 24.017. It is concluded that there is a significant value obtained.

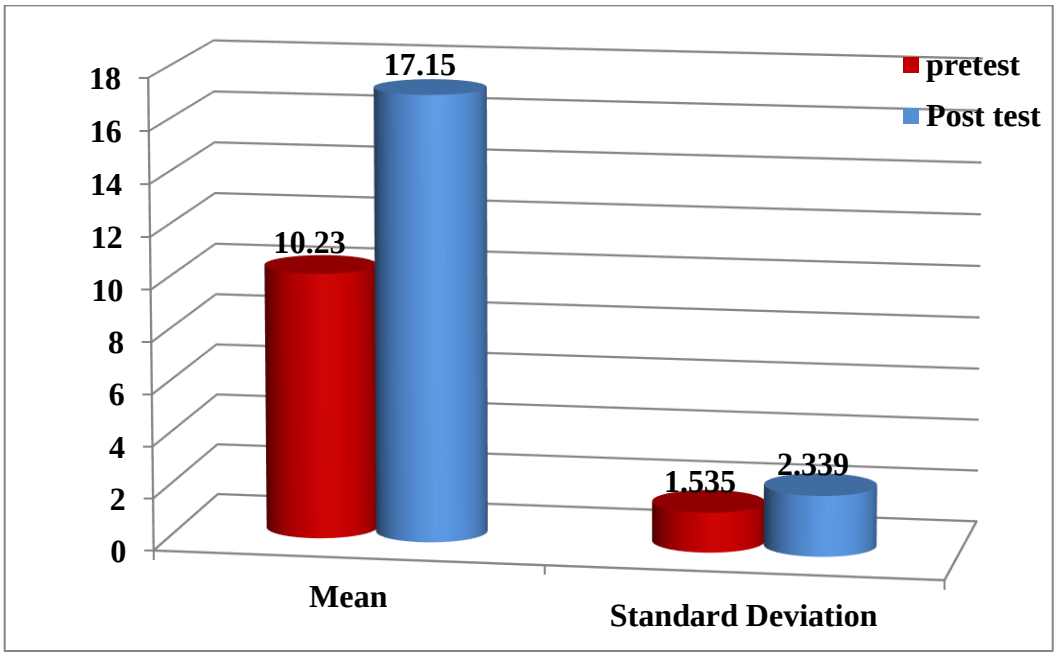


Figure 4.5 shows the mean value and standard deviation value of pretest and post-test of control group of GHSS.

Table 4.6

Significance of difference between the mean scores of the pre-test and post-test of the Experimental Group (Govt. Hr. Sec. School).

Type of Test	N	M	SD	't' Value	Remark
Pre-test	13	10.76	1.786	21.732	Significant
Post-test	13	14.61	1.445		

From the above table 4.6 it is observed that the mean score of pretest of experimental group of GHSS is 10.76 with standard deviation 1.786 and the mean score of post-test of experimental group of GHSS, is 14.61 with standard deviation 1.445. The t-value obtained is 21.732. It is concluded that there is a significant difference between the pre-test and post-test of experimental group of GHSS.

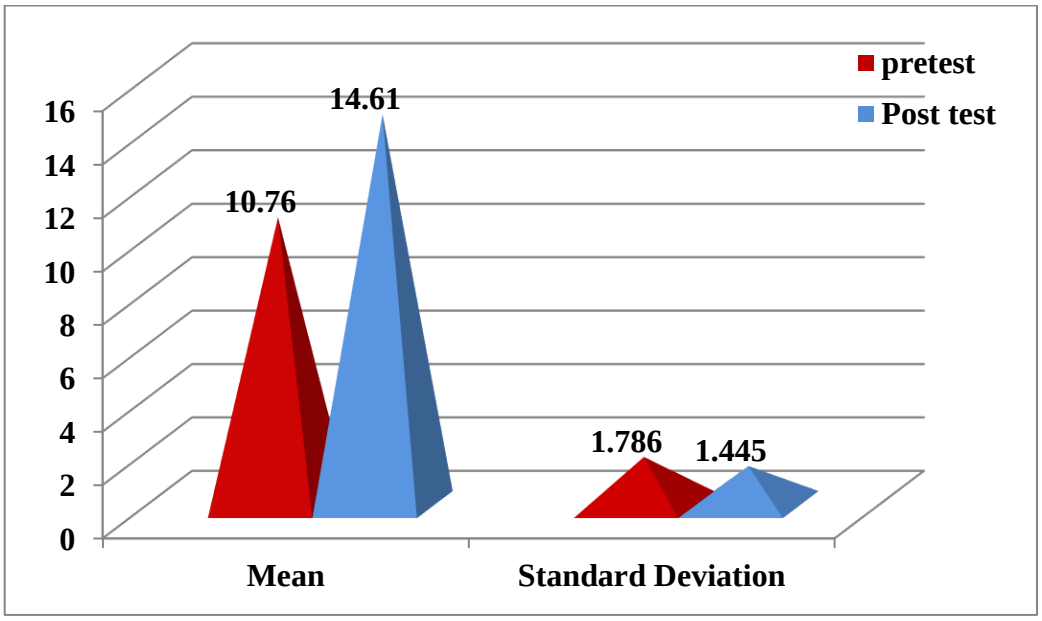


Figure 4.6 shows the values of Mean and standard deviation scores of Pretest and post-test of experimental group of GHSS.

Table 4.7

Significance of difference between the mean scores of the Boys and Girls in Experimental Group.

Gender	N	M	SD	't' Value	Remark
Boys	15	17.86	1.92	0.401	No Significant
Girls	14	18.14	1.84		

From the above table 4.7 it is observed that the mean score of Boys from experimental group is 17.86 with standard deviation 1.92 and the mean score of Girls from the same group is 18.14 with standard deviation 1.84. The t value obtained is 0.401. It is concluded there is no significant difference between the scores of Boys and Girls in experimental group. So, gender is not a factor in the development of Scientific Temper.

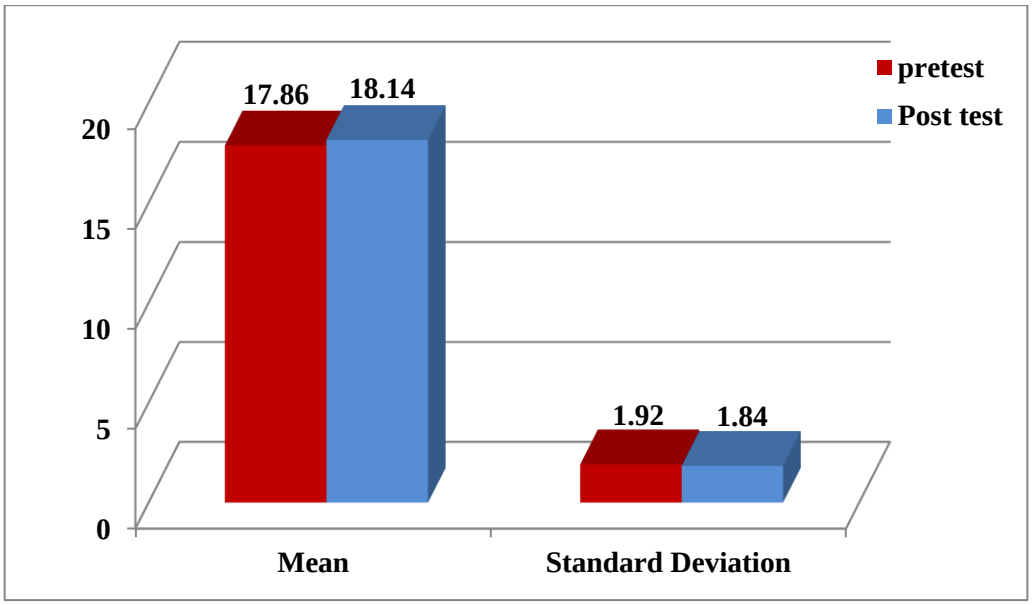


Figure 4.7 shows the mean and standard deviation of Boys and girls in experimental group.

CHAPTER - V

SUMMARY, CONCLUSIONS AND SUGGESTIONS

This Chapter presents a brief summary of the in retrospect, conclusions, Based on Findings of the study, educational Implications of the study and some suggestions for Further Research.

5.1. THE STUDY IN RETROSPECT

The main aim of the present study was to improve awareness about waste management among upper primary students.

5.2. RESTATEMENT OF THE PROBLEM

The present study was entitled, **"EFFECTIVENESS OF VIDEO LESSONS IN SCIENCE LEARNING AMONG UPPER PRIMARY STUDENTS IN PERAMBALUR DISTRICT"**

5.3. MAJOR FINDINGS

The major findings of the present study are listed as follows:

1. Among the 312 students there are 50 students are not needed training and 262 are needed training. Because the existing level of understanding of the students of upper primary level in video lesson is at average level.
2. Among the eight schools of sample for survey method, only the students of three school are having the scores less than 60% those are in need of Training on the development of video lesson.
3. The Existing level of video lesson of upper primary students is moderate based on the components viz, the frequency percentage for the students those are needed for Training on the improvement of video lesson belongs to

Generations 31 and 12.4% and that of Transportation. It is 33 and 13.2% and also it is 28 and 11.2% for Disposal, 27 and 10.8% for collection, 27 and 10.8% for produce energy via incineration respectively.

4. On the basis of the components of video lesson in waste management, there are 58.4% students needed for Training on the improvement of video lesson.
5. The mean, standard deviation of the pretest and post-test of control group of Govt. High School do not show much variation. There is a slight difference in the value of standard deviation.
6. The mean, standard deviation of the pretest and post-test of experimental group of Govt. High School show much variation. The students from experimental group achieved higher in post-test than their pre-test.
7. The mean value and standard deviation of the pretest and post-test of the control group of Govt. Hr. Sec. School Show little variation.
8. The mean score and standard deviation of the pretest and post-test of the Experimental group of Govt. Hr. Sec. School show a much variation.
9. The mean score and standard deviation of Boys and Girls in experimental group do not show variation. This indicates that the gender is not a factor which affect the improving understanding of video lesson.
10. The improvement of understanding of video lesson of Upper Primary Students is significantly increased by using ICT.

5.4. CONCLUSION

The major conclusions are emerged from the study are given below:

1. The existing level of understanding of video lesson of upper primary students is at average level.
2. Among the 312 students, after administering survey method, it is concluded that 146 students from 11 schools are needed for Training on the improving video lesson.
3. Among the selected 8 schools, the students from two Govt. High. School, have the frequency percentage for Training needed is more than 60 %.
4. The students from 6 Govt. Higher Secondary Schools have the frequency percentage for the training on the improvement of understanding of video lesson is more than 55 %.
5. On the basis of the understanding of video lesson, 58.4 % of students are needed for Training on the improving understanding of video lesson.
6. By using ICT for teaching of understanding of video lesson to upper primary students, the improvement of understanding of video lesson among them is increased. It is clearly shown from the scores of the values of mean, median.

5.5. EDUCATIONAL IMPLICATIONS OF THE STUDY

The initial survey study conducted as a part of the investigation revealed that the waste management of secondary school students is at average level. Efforts to create an objective, open-minded, logical approach with respect to accuracy in reasoning among children are still not adequate. This is a matter of serious concern. Understanding of video lesson involves the application of logic and the avoidance of bias and pre-conceived notions, which is behind the method of acquiring reliable and practical knowledge. Understanding of video lesson requiring solid information and incontrovertible date, and then suitable analysis before accepting anything. If a person uses the scientific method in his/her daily life decision making process

knowingly or unknowingly then we can say that he/she has awareness on understanding of video lesson. Nehru first defined and elaborated the concept of understanding of video lesson in ‘The Discovery of India’, points out that scientific approach should be an integral part of social interactions, as expressed by the quote “The scientific approach is or should be, a way of life, a process of thinking, a method of acting and associating with our fellowmen”. Thus understanding of video lesson is important in our life, this kind of attitude enable general public for making their decisions rational. Therefore the improvement of understanding of video lesson among the citizens is essential for the overall development of the nation.

Understanding of video lesson among the people could, in fact, bring into focus the essence of all religions, the universal laws governing the inner world of human beings and thus, promote communal harmony in a multilingual, multi-religious and multiracial country like India.

Understanding of video lesson among the students could in fact bring into focus the essence of all religions. The universal laws governing the inner world of human beings and thus promote communal harmony in a multilingual, multi religious and multi-racial country like India.

Preparing children to meet the demands of an uncertain future, however man require a shift in educational focus from the content to the process of learning.

At present there is no special attention paid in the school to improve the understanding of video lesson among the students and also the present educational institutions are not adequately equipped to handle the challenges in an advanced society. Materials and awareness programme may be used to serve the above purposes.

If we improve understanding of video lesson among the students then the land, water and air can be maintained as crystal clean. No COVID-19 pandemic attack anybody in this world.

It is concluded that the students improved their understanding of video lesson in this study.

If every school head provides the facilities for sorting out and gathering the garbage's the students definitely can have the required understanding of video lesson.

5.6 SUGGESTIONS OF THE STUDY

1. The infrastructural facilities and other technological facilities in schools are not sufficient for implementing innovative methods and strategies in science education. Therefore more facilities should be provided in all secondary schools for effective science learning.
2. Most of the teachers are very reluctant to change method of teaching which they have studied or followed. So they develop a negative attitude towards implementing any type of new instructional strategy.
3. The elements of convergent and divergent thinking should be continuously stressed and applied to the solution of the problems in classroom and school regularly.

5.7 SUGGESTIONS FOR FURTHER RESEARCH

1. Attitude of educational practitioners, administrators, curriculum framers, teachers and students towards inclusion of this package in school and college curriculum may also be studied.
2. A study on the relationship between the understanding of video lesson and the responsibility of children and the socio economic status of parents can be carried out.
3. Studies can be conducted with different experimental designs to collect more reliable data.

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APPENDICES

RESEARCH TOOL

Title : Effectiveness of Video Lessons in Science Learning Among Upper Primary Students in Perambalur District.

Researcher: P.VARATHARAJ, Senior Lecturer DIET Padalur, Perambalur.

Name of the Student:

Name of the School:

Class: **Date:**

Description	Yes	No	Not Known
1. There are several types of waste can be found at school premises anywhere else			
2. All the wastes are hazardous / harmful			
3. They are generated by students only			
4. They are generated by staff only			
5. They are generated by students and staff			
6. All are they cannot be separated			
7. The non – biodegradable waste play a vital role among them			
8. The biodegradable waste play a important role among them			
9. The non – biodegradable waste can be recycled			
10. The non – biodegradable waste can be reused			
11. The biodegradable waste can be used as manure			
12. All the waste can be sorted out			
13. The separate bins must be used to sort out.			
14. All the waste may cause environmental pollution			
15. The waste in school premises should be kept at separate bin.			
16. The non – biodegradable waste are dumped in a pit as bulky			
17. The e- waste are not dumped in a normal pit			
18. The major waste are non – biodegradable waste			
19. The biodegradable waste are utilized as manual in fields such as school garden roof garden and other cultivated fields			
20. The e-waste are dumped in specially constructed pit			

மாவட்ட ஆசிரியர் கல்வி மற்றும் பயிற்சி நிறுவனம், பாடாலூர்

செயலாராய்ச்சி முன்/பின் தேர்வு

மாணவரின் பெயர் : **வகுப்பு :**

பள்ளியின் பெயர் : **பாடம் :**

அனைத்து வினாக்களுக்கும் விடையளிக்கவும். **(20 x 1=20)**

1. அமிலத்தின் சுவை

அ. இனிப்பு ஆ. கார்ப்பு இ. புளிப்பு ஈ. துவர்ப்பு

2. அமிலம் என்பது ஒரு

அ. வேதிப்பொருள் ஆ. இயற்பொருள் இ. வாயுப்பொருள் ஈ. மாயை

3. எலுமிச்சையில் உள்ள அமிலம்

அ. லாக்டிக் அமிலம் ஆ. டார்டாரிக் அமிலம் இ. மாலிக் அமிலம் ஈ. சிட்ரிக் அமிலம்

4. சுண்ணாம்பின் நிறம்

அ. வெண்மை ஆ. நீலம் இ. சிவப்பு ஈ. பச்சை

5. அமிலமா அல்லது காரமா என்பதை கண்டறிய பயன்படும் சோதனை

அ. தொடுதல் முறை ஆ. சுவைத்தல் முறை

இ. நுகர்தல் முறை ஈ. லிட்மஸ்தாள் சோதனை

6. பாலில் உள்ள அமிலம்

அ. லாக்டிக் அமிலம் ஆ. சிட்ரிக் அமிலம்

இ. மலியிக் அமிலம் ஈ. கந்தக அமிலம்

7. முட்டைக்கோஸ் சாறு ஒரு

அ. கூழ்மம் ஆ. அமிலம் இ. காரம் ஈ. நடு நிலையானது

8. நீலலிட்மஸ் தாளானது அமிலத்தில் நனைத்த பிறகு என்ன நிறமாக மாறும் ?

அ. கருமை ஆ. சிவப்பு இ. பச்சை ஈ. நிறம் மாறாது

9. சிவப்பு லிட்மஸ் தாளானது அமிலத்தில் நனைத்த பிறகு என்ன நிறமாக மாறும் ?

அ. மஞ்சள் ஆ. நீலம் இ. பச்சை ஈ. நிறம் மாறாது

10. சிவப்பு லிட்மஸ் தாளானது காரத்தில் நனைத்த பிறகு என்ன நிறமாக மாறும் ?

அ. நீலம் ஆ. மஞ்சள் இ. கருமை ஈ. நிறம் மாறாது

11. நீல லிட்மஸ் தாளானது காரத்தில் நனைத்த பிறகு என்ன நிறமாக மாறும் ?

அ. சிவப்பு ஆ. வெண்மை இ. பச்சை ஈ. நிறம் மாறாது

12. கீழ்காண்பவற்றுள் எது மட்கும் குப்பை ?

அ. பழக்கழிவுகள் ஆ. ரப்பர் இ. பிளாஸ்டிக் ஈ. பீங்கான்

13. மட்காத கழிவுக்கு உதாரணம்

அ. காய்கறி கழிவுகள் ஆ. பாலித்தீன் பைகள் இ. குச்சிகள் ஈ இலைகள்

14. பிளாஸ்டிக் கழிவுகள் மட்குவதற்கு எடுத்துக்கொள்ளும் காலம்

அ. ஒரு வாரம் ஆ. ஒரு மாதம் இ. ஓர் ஆண்டு ஈ. பலஆண்டுகள்

15. பிளாஸ்டிக் சாக்கடையில் தேங்குவதால் ஏற்படும் விளைவு

அ. கொசு மூலம் மலேரியா நோய் ஆ. எய்ட்ஸ்

இ. கை கால்கள் பாதிப்பு ஈ. கண் பாதிப்பு

16. பிளாஸ்டிக் கழிவுகளால் ஆண்களுக்கு ஏற்படும் நோய்

அ. கண்வலி ஆ. விந்தக பாதிப்பு

இ. காதுவலி ஈ.இரைப்பை பிரச்சனை

17. பிளாஸ்டிக் கழிவுகளால் பெண்களுக்கு ஏற்படும் நோய்

அ. மாதவிடாய் பிரச்சனை ஆ. மார்பக பிரச்சனை

இ. சிறுநீரக பிரச்சனை ஈ. கர்பகால பிரச்சனை

18. பிளாஸ்டிக் கழிவுகளால் கால்நடைகளுக்கு ஏற்படும் நோய்

அ. குளம்பு வலி ஆ. தொண்டை அடைப்பான்

இ. கொம்பு வலுவிழத்தல் ஈ. முடி உதிர்தல்

19. பிளாஸ்டிக் பொருளுக்கு மாற்று

அ. உயிரி நெகிழி ஆ. லேசான பிளாஸ்டிக்

இ. கனமான பாலித்தீன் பைகள் ஈ. இரப்பர்

20. உயிரி நெகிழி தயாரிக்கப் பயன்படுபவை

அ. தொழிற்சாலை கழிவுகள் ஆ. தாவரக்கழிவுகள்

இ. விலங்கு கழிவுகள் ஈ. இரசாயனகழிவுகள்