

**A PROJECT ON  
PROJECTOR-AIDED COMPUTERIZED TEACHING  
FOR PRIMARY SCHOOLS  
CASE STUDY: ABTI INTERNATIONAL PRIMARY  
SCHOOL, YOLA.**

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## DEDICATION

**“To our parents, Mr. & Mrs. N. Samuel”**

– Nousheen N. Samuel

**“To our sister, Zarah Latif – Mannur”**

– Hamman W. Samuel

## **ABSTRACT**

This report is intended to convey information about the project carried out. The text has been divided into five chapters. The first and second chapters contain preliminary research and serve as a project overview, while the third chapter contains the procedures used to apply research work to make a software. The fourth and fifth chapters are meant as a project post-mortem.

In general, the aim of the project is to automate lesson notes.

# CHAPTER ONE

## 1.0 INTRODUCTION

This chapter contains details on preliminary research used in the conceptualization and collation of this project.

## 1.1 BACKGROUND OF STUDY

The projector has widespread use in higher institutions of most developed countries, where it is used to provide visual aids with lectures.

Now, the essence of the computer age is the elimination of repetitive tasks. The teacher, however, still manually issues notes year after year.

The project was conceived from these two scenarios. The idea is to use the projector as a medium of teaching rather than just a visual aid, and the computer in providing automated notes.

Due to the availability of a multimedia projector, this project could be applied to ABTI International Primary School, and more specifically to its Computer department. The institution is known for its innovative and practical approach to Computer education. Established in 1992, the school is equipped with state-of-the-art facilities. The Computer center is Internet-connected with all standard peripherals such as speakers, printers, scanners, UPS as well as projector and CD writer/burner.

## 1.2 PROBLEM STATEMENT

This project was made to overcome the problems of under-utilized computer resources available for teaching.

Firstly, the use of blackboard/whiteboard to give notes is insufficient in stimulating visual appeal for the age group under consideration. Studies have



shown that learning materials, which are attractive, will enhance the students' capacity of learning.

Also, the use of chalk causes health hazards to the teacher. Some researches indicate that teachers who are frequently exposed to chalk experience nasal and respiratory congestions. Skin and eye problems have also been known to occur.

Thirdly, the repetitive issuing and copying of notes by the teacher year after year becomes tedious.

### **1.3 OBJECTIVES**

The main goal of the project is the phase out of the blackboard and chalk. The impression received from features such as color and style have greater influence on students.

The computerization and automation of notes, tests and exams according to the school curriculum of computer education is another objective of this project.

The project also aims to improve the visual aspect of learning and teaching. This will make learning more interesting for students.

Lastly, the computerized notes on CDs can be used just as any textbook.

### **1.4 LIMITATIONS**

The scope of this project is to computerize teaching.

Nevertheless, the teacher will retain major roles, such as classroom management.

The project will not include an interactive interface with students.

Also, the use of the software of this project in other schools or subjects depends on the availability of a multi-media projector.

In general, research work is limited to primary schools.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

This chapter contains literature review and research on items relating to the project.

### **2.1 VISUAL AIDS**

Visual aids are educational materials that relate to the senses (Hornby). For example, pictures, books, maps, apparatus, or films are regarded as visual aids, and give a broader understanding of a particular topic.

Teachers often use visual aids to accompany lessons to provide a more practical view of a topic, with which students can readily relate (Awodoyin).

Visual aids promote enjoyable learning for the students. For instance, students learning about a country might be shown visual aids such as a globe or a map to locate where the country is; and pictures about the places of the country.

### **2.2 THE PROJECTOR**

A projector is a device for showing images, called presentations, on a screen. Projectors are used in business, theatres, schools, or other organizations. They are used for showing films, pictures, or providing visual aids.

The projector can show images on any flat and clean white area, such as walls or whiteboards. This area is referred to as the screen. The items showing at a time on the screen are called a slide. A presentation is made up of one or more slides.

There are two general types of projectors: analog projectors and digital projectors.

Analog projectors have to be operated manually. On the analog type, items are shown separately one by one. For this reason, analog projectors are sometimes called slide projectors. Projectors used in early cinema were analog. Continuous passing of each picture on a reel through the projector made the characters seem to move.

Digital projectors can be used with computers and normal video players and do not need manual running. For example, a Microsoft PowerPoint presentation on the computer can be seen on a whiteboard (screen) using a digital projector. Also, there is the option of how to deliver a presentation using a digital projector. The presentation can be run automatically or manually. For example, a self-running presentation can restart automatically when it has finished, or it can be restarted manually.

### **2.3 COMPUTERIZATION**

Computerization is to store information on a computer which can be used in problem-solving (Hornby).

In order to use the computer in solving problems, some sort of software is required. Software is another term for instructions that tell the computer what to do (Fapohunda). Without software, the computer would be useless.

There are two major categories of software: system software and application software.

System software controls the computer and contributes to its performance (Akeju et al). This software is usually provided by the manufacturer. Examples of system software include operating systems, such as Macintosh and Windows; and programming languages, such as Visual Basic and Pascal.

Application software enables users to solve a problem or perform a useful task based on their needs (Fapohunda). For example, spreadsheets such as Microsoft Excel or FoxPro can be used for statistical analysis. Other examples of application software are Microsoft PowerPoint, a presentation package, and word processing packages such as Microsoft Word.

Software which is available over the Internet is referred to as Internet software. The Internet is a worldwide collection of interconnected computers. Generally, Internet software can be downloaded for free. i.e. copied from one computer to another computer over the Internet. Internet software is of two types: demo ware and trial ware.

Demo ware is only a part of a program and not the full program. i.e. incomplete software.

Trial ware stops working after a trial period, unless it is bought. An example of trial ware is Text to speech software.

Demo ware and trial ware are intended to get the user interested in the full program.

All software has their system requirements. i.e. the kind of hardware, etc that is compatible with it before they can be used.

### **2.3.1 Microsoft PowerPoint**

PowerPoint is a presentation package that makes it easier to create a variety of graphics for educational presentations.

Creating a presentation in PowerPoint involves adding new slides and content after choosing layouts, modifying slide design, and creating effects.

**Presentations** – PowerPoint has various options for creating a presentation.

These include:

Blank – Slides that have no color.

Existing presentation – Slides based on existing slides. This command creates a copy of a previously created presentation.

Design template – Starts slides based on a PowerPoint template.

Templates with suggested content – Uses the AutoContent Wizard to apply a design template.

**Layouts** – "Layout" refers to the way things are arranged on a slide. A layout contains placeholders, which in turn hold text such as titles and bulleted lists and slide content such as tables, charts, pictures, shapes, and clip art.

**Animation** – Animation is to add a special visual or sound effect to text or an object. Animation causes focus on important points in a presentation, allows control of flow of information, and adds interest to a presentation.

**Timings** – The transition between one slide show and another is called the slide transition. This will depend on how long a slide is shown on the screen, known as the sleep time. Action between items can be delayed using timings and slide transitions.

**Sounds** – Sounds can be added to a slide from sound files on the computer, the Internet or Microsoft Clip Organizer. Sounds can also be recorded to add to a presentation by using a microphone.

**Hyperlinks** – In PowerPoint, a hyperlink is a connection from a slide to another slide, a custom show, a Web page, or a file. The hyperlink itself can be text or an object such as a picture, graph, shape, or WordArt. In PowerPoint, hyperlinks become active when a presentation is run.

An action button is a ready-made button that can be inserted into a presentation.

An action button also activates a hyperlink, depending on the action setting.

Action buttons are commonly used for going to the next, previous, first, and last slides, in self-running presentations.

### **2.3.2 Text to speech software**

Text to speech software is available on the Internet as trial ware. Text to speech (TTS) software converts files of text to voice files. It can be used to administer text documents of lectures, presentations, notes, papers as words of speech/narration.

**Text files** – Files of this type (.TXT) do not contain any graphics and are suitable for use with TTS software.

**Voice files** – Voice files contain information that the operating system uses to mimic speech. TTS software synthesizes .TXT files into .MP3, .WAV, .WMA, .OGG, or .VOX files.

### **2.3.3 Visual Basic**

Visual Basic is a programming language that provides tools needed to create Windows programs with familiar elements such as menus, text boxes, command buttons, scroll bars, etc.

Visual Basic is an event-driven programming language in which programs are no longer a sequence of step-by-step operations. The programmer does not take

control of the sequence of execution. Instead, the user can press keys or click on buttons in a window, and each action can cause an event to occur, which triggers a specific procedure that the programmer has written.

**Graphical user interface** – The user interface defines how the various elements of a program look and function. This includes icons, buttons, and menus.

**Projects** – In Visual Basic, a single ‘program’ contains various files, collectively known as a project.

**Forms** – These contain all other controls, and make Visual Basic programs similar to the Windows environment.

**Controls** – Visual Basic has various controls such as command buttons, scroll bars, option buttons, etc that can be added to a form.

**Environment** – The Visual Basic environment is where programs are written and tested. This consists of:

Form window – This is where forms are designed.

Project Explorer window – This holds file names of the files in a project.

Properties window – This is where properties are set for the controls i.e. how the controls look.

Toolbox – This holds controls that can be placed on forms.

Code window – This is where code is written.

Main window – This holds the menu bar, toolbar, and information about the project.

**Programming** – Writing a program in Visual Basic is a 3-step process. This involves setting up the user interface, defining the properties, and then creating the code.

Define the user interface – This stage involves placing controls on forms according to requirements.

Set the properties – The characteristics, such as colour, size, contents, etc., of each control on the form are set.

Write the code – Visual Basic borrows heavily from the Beginners All-purpose Standard Instruction Code (BASIC) programming language for the coding stage. Code is written in procedures for each control separately.

**Components** – These allow programming another application from within Visual Basic. The power and flexibility of applications such as Microsoft Excel, Microsoft PowerPoint, etc can be easily incorporated into Visual Basic projects in this way.

**Executable files** – Visual Basic projects can be converted to .EXE files that run from the Windows desktop.

## 2.4 SYLLABUS

The term “syllabus” usually applies to educational planning and a goals statement of what is to be achieved (Dulaney et al). For example, the syllabus of a subject or course contains a detailed outline of what is to be learnt/studied. Continuous assessments and lesson notes of the subject draw their content from the syllabus (Hornby).

For instance, a syllabus for computer literacy would include an understanding of computer hardware, software, and the application of computer technology to various socio-economic fields.

Some experts feel that in addition to this, computer literacy should also include some insight into the history of computers and the impact of computers on the



society, along with actual experiences with computers, such as games and word processing. Students should also have some exposure to programming.

## CHAPTER THREE

### 3.0 METHODOLOGY

This chapter details on procedures and programming used to achieve the goals of the project.

### 3.1 REQUIREMENTS DEFINITION

In this stage, data requirements for computerization were established and existing methods were reviewed.

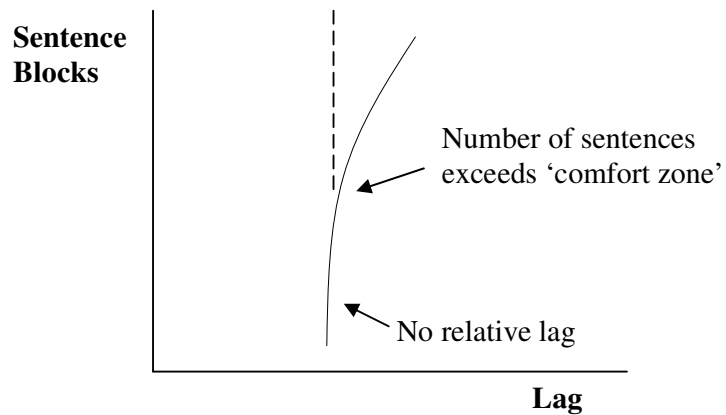
#### 3.1.1 Sleep time

For students to comfortably and correctly copy down lines of notes displayed as slides, there should be enough time (i. e. sleep time) between successive slides.

Microsoft PowerPoint is to be used for displaying the notes as presentations. The sleep time for a slide in PowerPoint is set using the Slide Transition property.

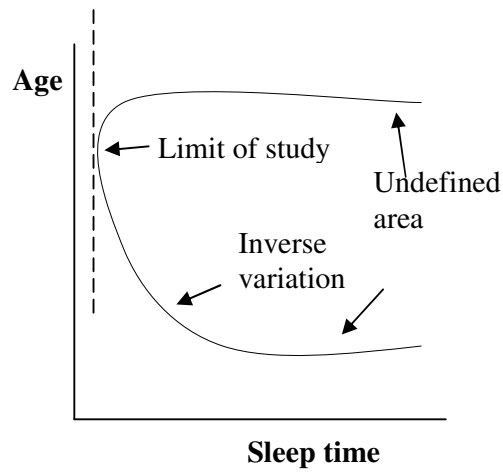
An initial survey showed that a few sentences shown at a time per slide are more effective in preventing the students lagging behind.

#### Relationship between lag and sentences

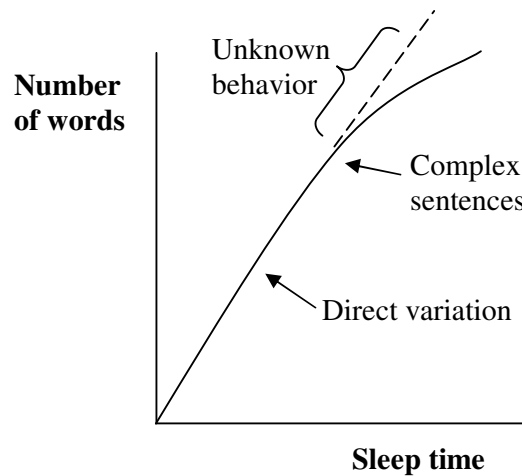


Also, studies show that a comfortable sleep time varies with the number of words on a slide, and the age of the pupils.

### Variation of sleep time with age



### Variation of sleep time with word count



This shows that for junior classes, the sleep time should be higher. In addition, the sleep time per slide should be higher when longer sentences are used.

To configure the sleep time, simple experiments will be conducted using a prototype, to measure the average sleep time per class (students of a class are given notes to copy within a limited period of time. When the time elapses, the number of words successfully copied by the student is recorded, and the sleep time calculated by ratio)

i.e. T1: W1

X: W2

viz  $X = (T1/W1) \times W2$

The table below shows data gathered on the sleep time adequate for slides containing up to 15 words:

**Measure of sleep time for primary school students**

CLASS	TIME ALLOWED (min)	WORDS COPIED SUCCESSFULLY	CALCULATED VALUE OF SLEEP TIME FOR 15 WORDS (min)
Primary 1	10	5	30
Primary 2	10	8	19
Primary 3	10	12	13
Primary 4	10	14	11
Primary 5	10	15	10
Primary 6	10	19	8

The use of an average measure of the sleep time will ensure that most of the students in a class do not lag behind, and are kept ‘busy’. It will also encourage slow students to work harder.

Nevertheless, navigation buttons will be provided to control the sleep time per slide in case of discrepancies.

**3.1.2 Scheme of work**

The scheme of work is a plan of how lessons are to be administered during the school calendar. For each term, the scheme of work is divided into 10 weeks, making room for revisions and practicals.

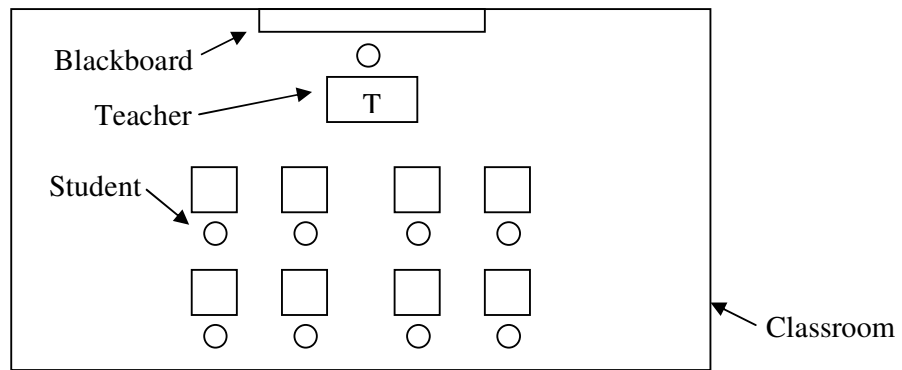
To achieve this, this syllabus used by ABTI Primary school for teaching basic computer education was modified to suit single one-hour lessons. The syllabus outline was reprinted accordingly (see appendix).

**3.1.3 Projector placement**

Seating arrangement is the physical arrangement of students in the classroom.

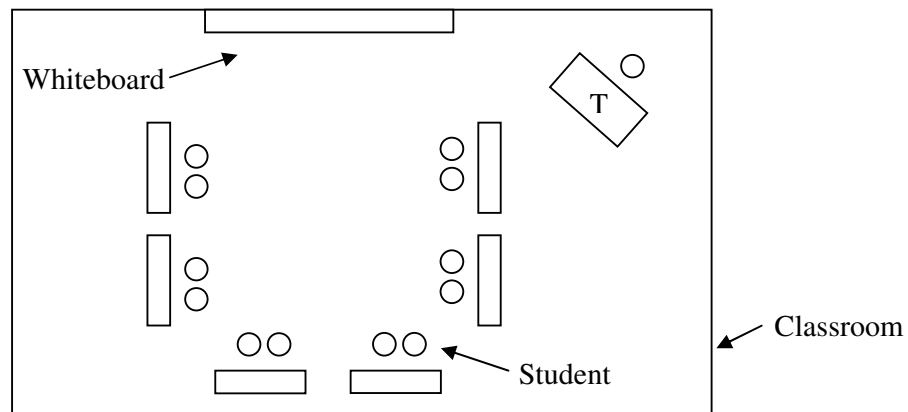
The traditional arrangement is with rows of desks with a teacher's table in front.

### Classic seating arrangement



Other arrangements have adjoining tables with a teacher's desk in the periphery.

### Modern seating arrangement



The arrangement of the computer center of ABTI Primary school is of the latter type. The projector is accordingly to be placed in a location that does not come between the students and the whiteboard. To achieve this, the projector will be placed at a lowered, vertical level and perpendicular to the viewing screen/whiteboard.

The projector available does not have a long range, and will have to be placed nearer the whiteboard. Also, the current seating arrangement will be maintained.

The projector will be connected to the external display port of a computer system, and projector settings will be adjusted for optimal readability, such as brightness, zoom, contrast, etc.

Speakers will also be connected to the same computer system.

## **3.2 SOFTWARE DESIGN**

The software design is what is to be used in programming. An outline of the functions, specifications and operations of the intended software are depicted.

### **3.2.1 Functional design specifications**

The functional design specifications (FDS) are meant to describe the software from the user's perspective. At this point, emphasis is on output requirements. The layout and contents of display screens is specified. This included the workings of the software when in use.

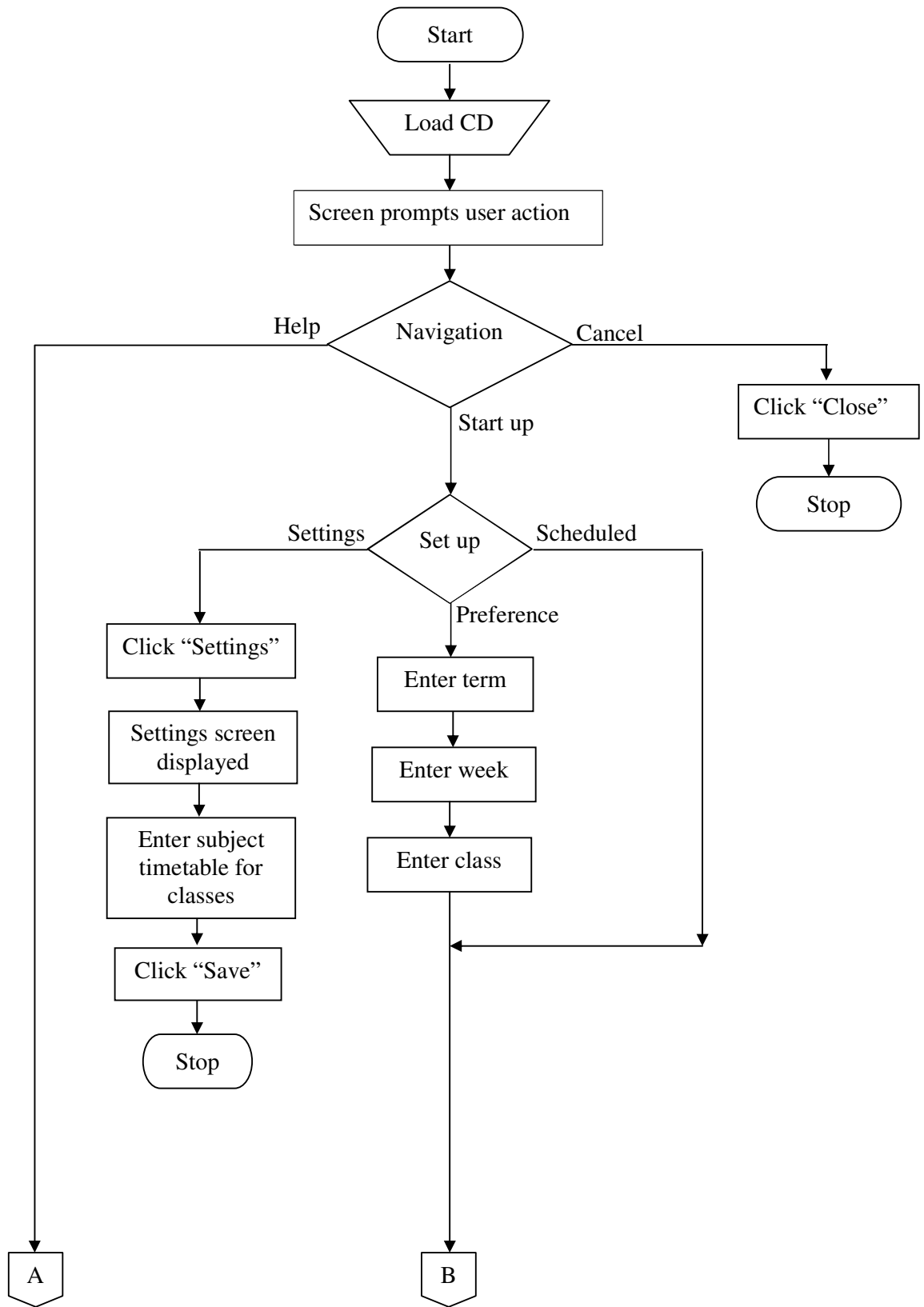
The following navigations will be performed:

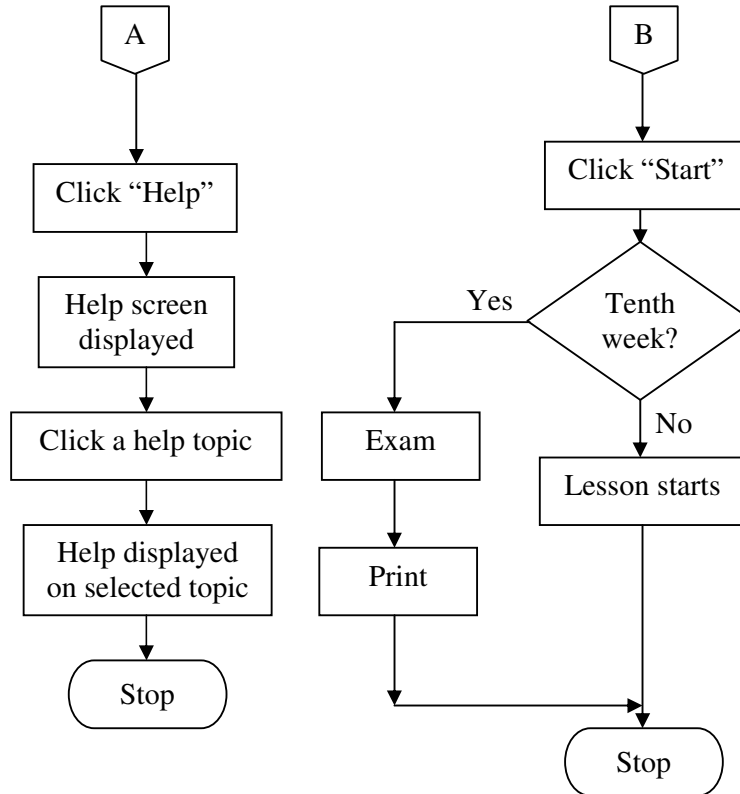
**Start** – The lesson will be started according to pre-defined settings.

**Settings** – Configuration of the weekly schedule of lessons.

**Help** – Displays help on specific topics.

**Close** – Exits the software.





### 3.3.2 Detailed design specifications

The detailed design specifications (DDS) include all processing activities and the input/ output associated with them. The relationship between processing activities and control requirements is established.

The detailed outline of the software design, which this stage entails, is the result of user feedback/ requirements definition.

**Files** – The following files will be included:

PPS – PowerPoint slide shows containing lesson notes that run automatically.

EXE – Executable files required for user input.

WAV – Sound files containing vocal aid/ dictation.



MDB – Component database files containing configuration of the timetable.

**Screens** – Two types of screens are used:

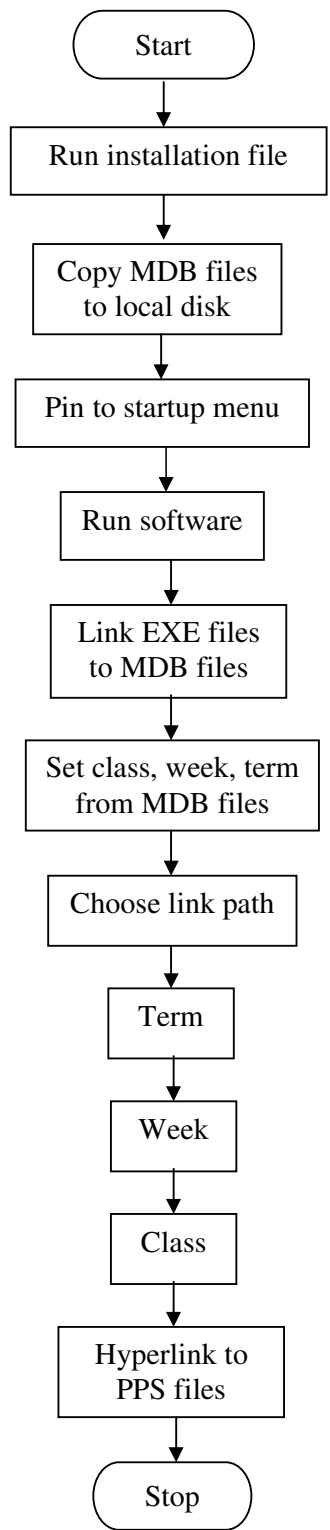
Forms – These request input from the user.

Slide shows – These contain lesson notes and exams.

**Hyperlinks** – Hyperlinks are set to determine how the screens are to be navigated. A form will hyperlink to slide shows according to the current term, week, and class. These links will be from files installed in the computer to files on CD.

**Installation** – The CD will contain most files of the software. However, updatable MDB files will be copied to the computer during an installation process.

**Error handling** – If an error occurs concerning the slide transitions, the user may navigate the slides manually.



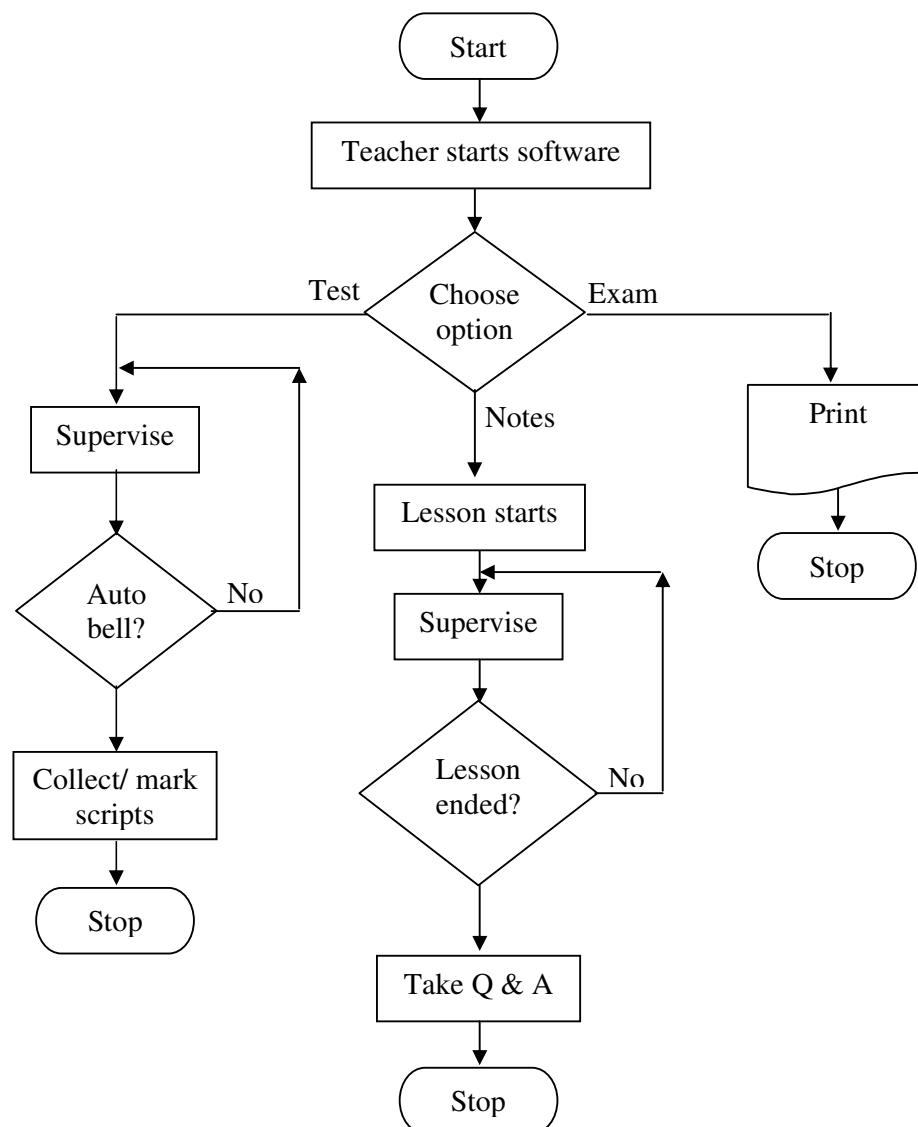
### 3.2.3 General design specifications

The general design depicts the fundamental operation of the intended system. It contains general descriptions of the software usage. The software will be designed to perform the following operations:

**Administering notes** – The software will contain notes on basic computer education.

**Giving tests** – The teacher may give tests by using the software.

**Printing exam papers** – Exam questions will be included with the software.



### **3.3 SOFTWARE DEVELOPMENT**

In this stage, the software design is translated into a programmed structure to make the intended software operational. This phase starts with identification of software to be used in programming.

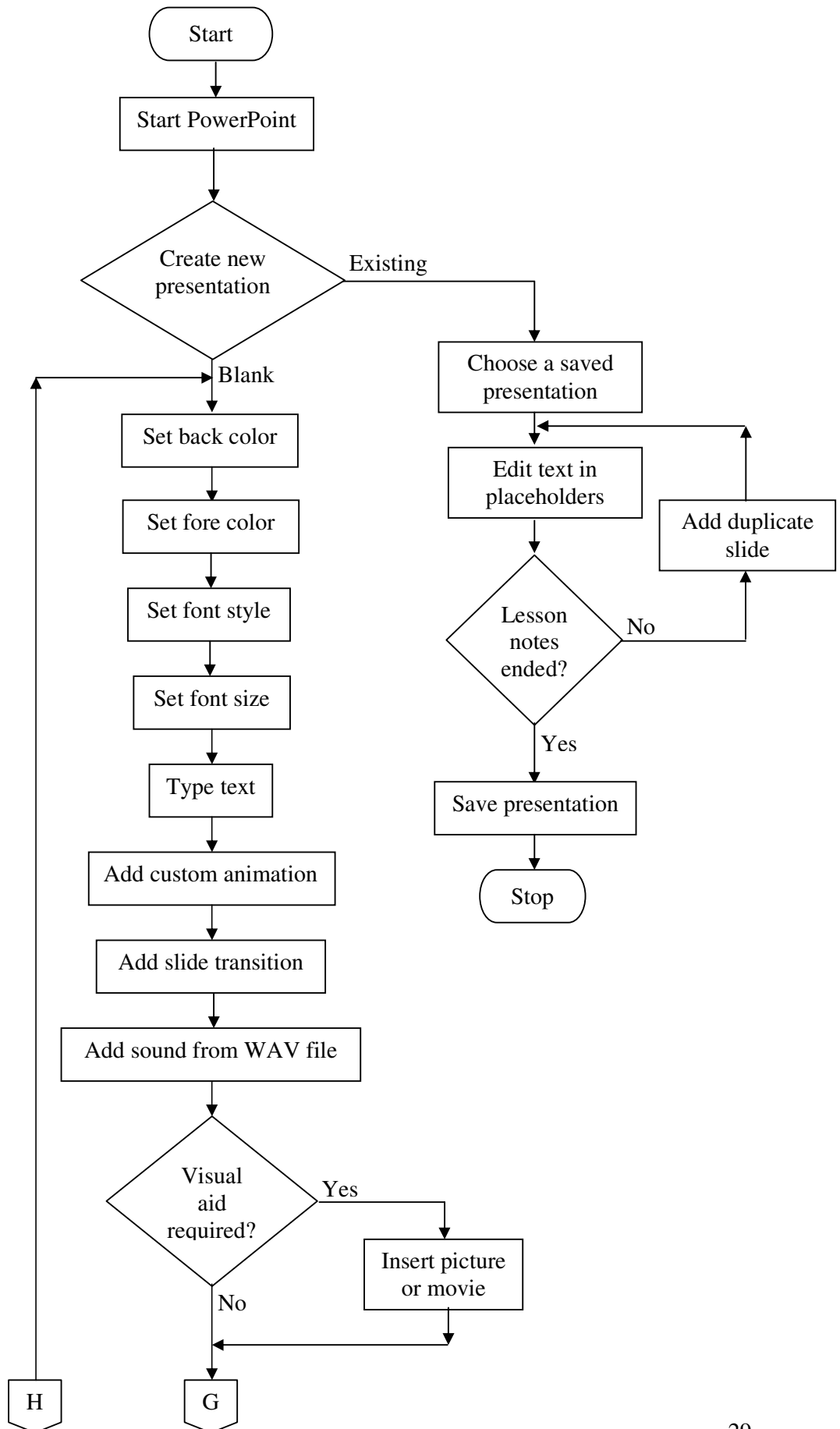
This project work used Microsoft PowerPoint for its flexibility and ease in creating automated presentations.

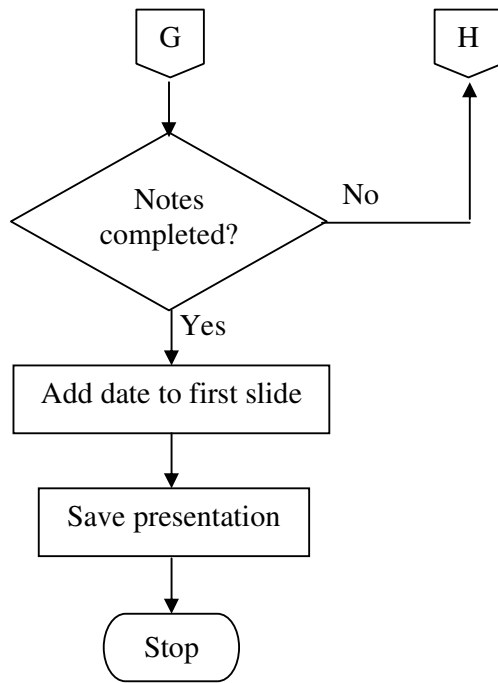
Also, text to speech software was used for its obvious vocal advantages. The Internet was used to download TTS software due to its unavailability on most PCs. Visual Basic was used to create a simplified user interface in navigating through the software, and also to link the various files.

#### **3.3.1 Coding**

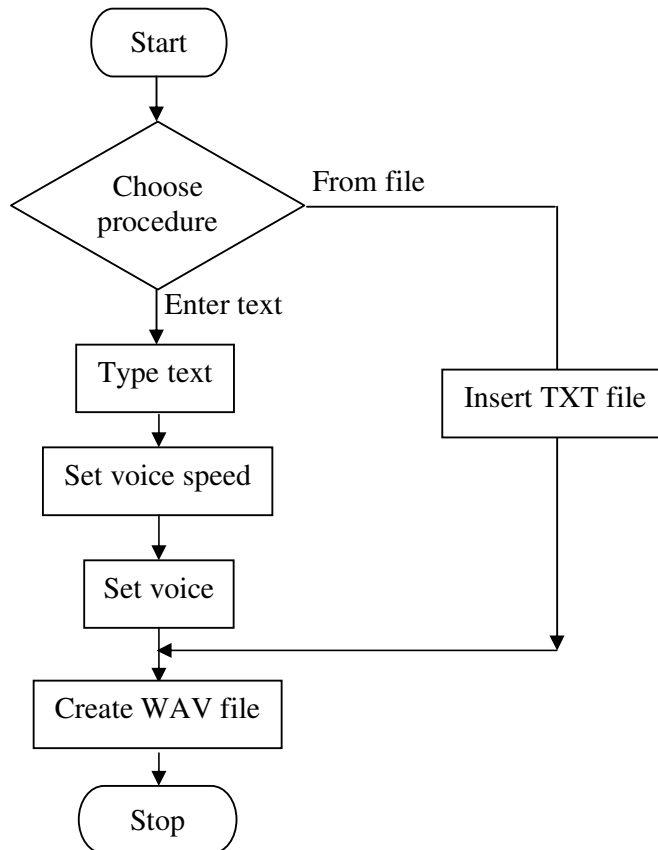
Each software to be used is to be programmed separately. These will be linked together to create the intended program.

**PowerPoint** – The programming of an application software involves setting properties to predefined items as appropriate. The files in PowerPoint were saved as PowerPoint slide shows.

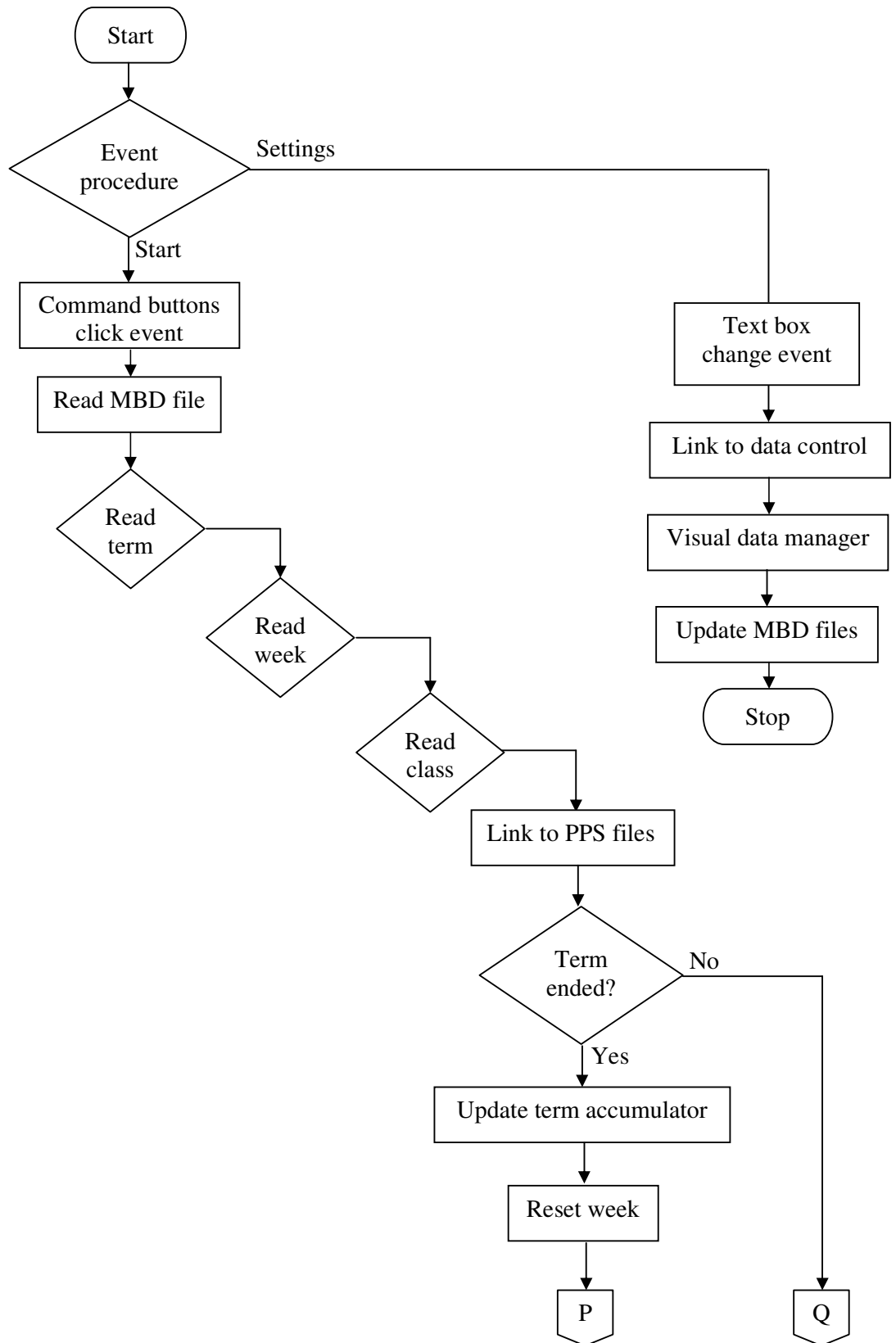


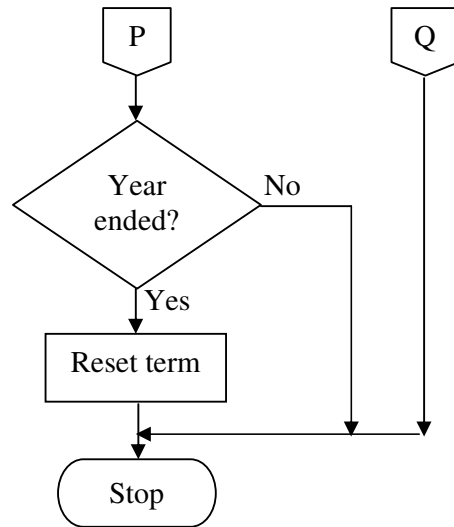


**Text to speech** – The contents of the notes were re-entered into TTS software and converted to sound files.



**Visual Basic** – The program was written to suit user action and an executable file was created.





### 3.3.2 Testing

Testing covers everything that makes up a system – the hardware, the software, the end users, and the data.

Firstly, the software is to be tested for residue of any errors. To ensure that the software could be fully operational, it is tested using simulated situations, by using a prototype. Here, it is determined whether the students were able to cope with the new system in terms of the appearance and automation. Any modifications required are made until the prototype functions according to expectations.

The second stage of testing is done with live data in real - life situations by using the people who would eventually use the software.

### 3.3.3 Documentation

Documentation involves providing a written description of the software program. There are three types of documentation: user documentation, technical documentation, and support.

**User documentation** – User documentation assists non-specialists in the use of the software package. The user is provided with “online” help included with the software.



**Technical documentation** – Information about the software documented in this project report would enable another programmer to modify the software. This documentation includes the way that the program works (FDS), together with a listing of the software's processes (DDS).

**Support** – Support is the provision of a means by which help may be made available to users in future. A contact address will be provided by which the end – user may contact the authors.

## CHAPTER FOUR

### 4.0 ANALYSIS

This chapter is intended to give an account of the project application as well as an analysis of the new system.

### 4.1 STORAGE

The produced software has to be stored. This can be done in two ways: primary storage and secondary storage. Secondary storage devices such as diskettes and CDs are a secure form of storage and save the computer space being taken up. For this project, the software was stored on CD due to the file sizes and number of files involved.

The CD is to be used with a computer system in proximity of a projector.

### 4.2 CONVERSION

Conversion is the process of changing from old methods to new methods. There are four ways of achieving this:

**Pilot approach** –The new method is tested elsewhere to see if it works.

**Crash approach** – Old methods are discarded and replaced with the new ones.

**Parallel approach** – Former methods are practiced along with existing methods.

**Phase approach** – Sections of the new system are converted one at a time.

For the purpose of this project work, the method used was the phase approach.

This method of conversion would allow the management to follow the new system gradually.

### 4.3 SYSTEM COMPONENTS

Classroom supervision is the set of plans and actions which the teacher uses to ensure that the learning in the classroom is effective and efficient. It also

involves teaching students how to behave in a classroom setting, as well as maintaining discipline.

Evaluation is based upon pertinent information, which has been gathered from sources such as tests and classroom observation. Scores are a measurement function, which provides the teacher with data regarding the success of teaching. For this project work, the teacher maintains his role of classroom supervision and evaluation. This will also include marking scripts.

#### **4.4 APPRAISAL**

It is necessary at this stage of the project to critically evaluate the extent of success or otherwise of the project work carried out. The questions to be considered are:

**Modifications** – *Are there any sections that had to be modified in the light of experience gained while writing the project?*

The software interface was further simplified to suit user needs. Also, the dictation files were not included with the submitted software due to file size constraints.

**Application** – *How smoothly can the old methods be substituted by new methods?*

The system of Projector – Aided Teaching can easily substitute blackboard – and – chalk methods, for teaching basic computer education especially, because the case study already has a projector.

**Maintenance** – *Is the new system sustainable?*

ABTI International Primary School already has maintenance expertise on ground.

**Life cycle** – *Is the software limited to any period of time?*

The software may have to be updated if any syllabus used for teaching computer science in primary schools is revised.

## **CHAPTER FIVE**

### **5.0 SUMMARY**

This chapter gives an overview of the project work. This project was conceived to alleviate some of the problems associated with teaching.

Initially a study of ABTI International Primary School was carried out. The results of this study do not apply only here, but to teaching in general. Due to the availability of a projector at that institution, the idea of Projector – Aided Teaching was conceived.

Finally, the necessary software was developed to achieve set objectives, and the software was made available to the case study.

In the educational sector, any institution with the resources to do so can use the projector as a teaching aid. In other socio – economic sectors, Projector – Aided Teaching can be applied to basic education.

The software produced can be applied by other primary schools. It can also be used as a self – teaching guide.

### **5.1 CONCLUSION**

Projector – Aided Computerized Teaching is an effort towards a new Educational Technology by which teaching can become not only easier, but also more interesting, both to the teacher, and the student. The project enabled the authors to contribute to the society, and to apply the knowledge of Computer Science in a creative and practical way to a real - life situation. It is hoped that this project is a first step in what becomes a new era in education.

### **5.2 RECOMMENDATIONS**

It is recommended by the authors that other institutions use the method of Projector – Aided Teaching. All that is required is the procurement of projectors,

and the necessary expertise to store lesson notes to a computer system. The cost implications may be high initially, but they tend to fade out in the long run.

There is also room for further development and improvement of the software.

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HTML Help (Microsoft Corporation)

Microsoft Office XP Help (Microsoft Corporation)

MSDN Library Visual Studio (Microsoft Corporation)



# APPENDIX

## SYLLABUS

### 1. MACHINES

- i) Uses of machines (usefulness of machines in making work easier)
- ii) Types of machines (mechanical and electronic)

### 2. COMPUTERS

- i) Parts of a computer
- ii) Complete and Incomplete computer

### 3. USES OF COMPUTERS

- i) What computers can do
- ii) What computers cannot do
- iii) People who use computers (development of occupational interest)
- iv) Places that use computers

### 4. COMPUTER VOCABULARY

- i) Computing terms
- ii) Computer acronyms

### 5. THE COMPUTER CENTER

- i) Introduction
- ii) Conduct in a computer room (e .g. shutting down, logging off)

### 6. HISTORY OF COMPUTERS

- i) Early computers (early computing machines e.g. Napier's bones)
- ii) Generations of computers

### 7. TYPES OF COMPUTERS

Classification of computers according to their size

## 8. PERIPHERALS

### i) Types of peripherals (Practical knowledge of how these work)

- a) Input devices
- b) Output devices

## 9. COMPUTERS AND COMPUTER SYSTEMS

### i) Introduction

### ii) Components of the computer

- a) Hardware
- b) Software
- c) People ware

## 10. TYPING

### i) Identifying keys

### ii) Types of keys on the keyboard

- a) Number keys
- b) Alphabet keys
- c) Symbol keys
- d) Arrow keys
- e) Function keys
- f) Special keys

### iii) Word processing

- a) Alphabetic arrangement of the keyboard
- b) Typing methods (methods to be avoided e.g.” Hunt and Peck”)

### iv) Calculating

- a) Numeric arrangement of the keyboard
- b) Calculating from the keyboard

v) Fingering

Knowledge of proper fingering and body posture for efficient typing

11. DATA AND INFORMATION

i) Data

ii) Information

iii) Computers as processing devices

12. STORAGE

i) Concept of memory (everyday meaning of memory)

ii) Computer memory

iii) Types of Computer memory

a) Primary storage

b) Secondary storage

iv) Units of Computer memory

13. THE INTERNET

i) Introduction

ii) Using the Internet (vocabulary such as browse, surf, etc)

iii) Uses of the Internet

14. WINDOWS

i) Features (e.g. icons, menus)

ii) Using Windows

15. PROGRAMMING

i) Definition

ii) What is a program

iii) Programming languages (e.g. BASIC)

## SCREEN SHOTS

### Startup options

Term	<input type="text" value="1"/>	<input type="button" value="Start"/>
Class	<input type="text" value="2"/>	<input type="button" value="Settings"/>
Arm	<input type="text" value="A"/>	<input type="button" value="Help"/>
Week	<input type="text" value="9"/>	<input type="button" value="Close"/>

### Timetable settings

Time	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30
Day	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	1:00
Monday										
Tuesday										
Wednesday										
Thursday										
Friday										

### Change Password

Old Password   
(Maximum 10 characters)


New Password

Password hint

## Help Topics

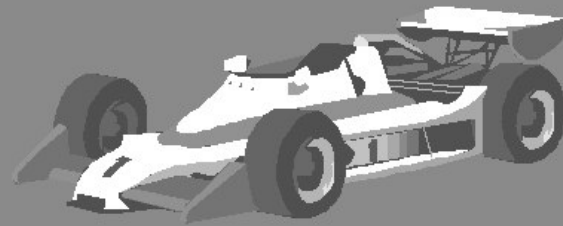
- [Primary 1](#)
- [Primary 2](#)
- [Primary 3](#)
- [Primary 4](#)
- [Primary 5](#)
- [Primary 6](#)

**Scheme of work**  
The work load is divided into 10 weeks, making room for practical drills by the teacher.



Lessons Tests Exam Timetable Passwords **Scheme of work** About

A car is a machine.



16 October 2003

### Internet basics

The word "Internet" is the short form for INTERNational NETwork.

