

*Advanced Higher
Computing*

Project

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Project Proposal

What is the background to the project?

Young children are encouraged in early primary school years to learn simple mathematic and language skills on a computer. Although prior to this learning they have no previous experience of computing skills. Young children of Pre-School age should be able to use a computer system, but are not given the opportunity to learn the basic skills. Therefore core learning is held back in latter years due to unsatisfactory IT learning in the early stages.

What is the nature and extent of the project?

I intend to produce a piece of software to enable young children to establish the basic computer skills as a foundation to there IT learning. I shall do this by having two separate learning games, Mouse Movement and Keyboard Skills.

In Mouse Movement, the aim is to begin the process of practising using the mouse. My intent is to have a bright screen layout and have, my star of the software, *Daffy Duck*, introduce the task. This will be presented on the screen in the form of text and also verbally spoken as children of such a young age might not be able to read the text, but will be able to understand vocal communication. The exercise will take the form of six coloured splodges on the screen, *Daffy Duck* will tell them to click on a certain colour and the user should move the mouse over the appropriate colour and click. Mouse Movement should learn the user the importance of accuracy when about to click. It also shows that by clicking, a reaction occurs, important as part of psychological theory of learning. (Classical Conditioning: *Pavlov 1849 – 1936*)

Again in Keyboard Skills *Daffy Duck* introduces the exercise. This time a word appears on the screen, *Daffy Duck* instructs the user to “type the word”. The user should type the word in the text box provided, and then click “OK”. Here we are reinforcing the previous exercise to allow the user to practise.

In both activities, if the user enters the word correctly, clapping will sound, again for the psychological reason that if the child is being praised they are encouraged to repeat the event again and the next colour/word will appear. On the other hand if the user gets it wrong, TRY AGAIN will appear, three incorrect answers and the task will be completed for then in slow motion to allow then to learn from there mistakes.

What books and literature are there to support the project?

There are a number of sample designs to study, both from the Internet. Psychologists Pavlov and Skinner influence the theory of learning. Design of the project is influenced by ADIBOO.

***What will be main features of the method of solution?
(Including the data required, features to be included.)***

The solution is to concentrate on the key areas of:

1. Mouse Movement
2. Keyboard Skills

I will need to create text for the opening page and also decide on a main character to introduce the activities and hold the users attention. I will need to draw the activity patterns and designs in "Paint" and uplift then to Power Point. Pictures of the main character will have to be copied from the Internet. I intend to use "Google Images" to find and upload graphics. I wish to make use of the software application easy to use as well as visually appealing.

What hardware and software resources are needed? Are these available?

Personal computer
Microsoft Power Point
Microsoft Word
Access to the Internet
A copy of ADIBOO (reference use only)
Computer Microphone

All of these resources are available.

State the main stages of the project and the estimated times for completion

Analyse problem	3 hours
Refresh my knowledge of Power Point	2 hours
Record voice notes	1 hour
Design page layout and links	5 hours
Implement and test solution	10 hours
Refine solution	5 hours
Write evidence for assessment	10 hours

Project Specification

What is the scope and objectives of the project?

The project scope is to look into the possibilities of learning children of pre-school age simple computer skills. The project objectives are:

1. To provide an academic piece of software.
2. To provide a piece of software that is visually appealing.
3. To enable young children to familiarise themselves with personal computers and peripherals

What activities will be carried out?

There will be three main areas to the project. Two of which is in the form of learning games, Mouse Movement and Keyboard skills (described fully in “proposal”). The others, an opening page, which will consist again of the main character, this time introducing the software package and explaining to the user how to choose one of the learning games. On this page there will also be a “Parental” section. This is geared towards the adults/parents. It is a written explanation of how to play the learning games in case any difficulty arises.

Once I have a rough plan for each page and my design ideas are clear I can start the implementation. I will produce some parts of the assessment evidence as I go along.

What are the inputs?

The information required by the system is the psychological theory of learning; where-by I shall establish just how the software will look. The design will be influenced by other software in this field and altered to suit a younger age group. All of this information is available online, as examples of prior projects can be found, and also the work of psychologists Pavlov and Skinner, as my design is influenced by there theories.

At present children go straight to the computer without any prior knowledge. Watch them. They have no control over the mouse; they cannot hold the mouse in position and click at the same time. I shall therefore be concentrating on this action, to allow for practise. The QWERTY can be confusing to a child; the alphabet is all jumbled up. I intend to familiarise the user with the keyboard.

It has been decided that the solution, in order to make the best impression with the child should have bright colours and have sound. Therefore the inputs to the system are audio and visual. Prior experience of teaching a child computer skills is useful.

What are the outputs?

The output from the system is a software program that will take the form of learning activities for children of a pre-school age. The program has to be user friendly, as young children will use it. It also must have an adult section for parents/teachers so that they too can understand the background to the program. The whole solution must blend into one, easy to use unit.

What are the boundaries?

A child-learning zone can be rather large in terms of learning computer skills. For time allowance I feel I have to keep the software to just two main areas. These boundaries are to produce a solution, which is brief, almost a prototype to what could be done with this sort of program if a company was wishing to produce such software.

Boundaries of Problem

1. Age – designed for 4 – 6 years
2. Only deal with 2 areas – mouse movement and keyboard skills
3. Word bank of only 5 words in K.S
4. Colour bank of only 5 colours in M.M
5. Sound will only be there during closing screen and when correct answer.

Boundaries of Mouse Movement

1. Order of colour will not vary, it will stay in the same sequence for every user or attempt
2. Shapes will be static
3. Only 6 colours will be used

Boundaries of Keyboard Skills

1. Order of words will not vary, it will stay in the same sequence for every user or attempt
2. Only 10 words will be used

What resources are needed? Are they suitable?

I will be using a DELL LATITUDE laptop computer with Microsoft Power Point as the package that actually makes the software program. I will be using the Internet to find all the images that shall be used; I shall be using “Google” as the search engine to find suitable images. I am using Microsoft Word to type up my report.

What criteria will be used to validate the solution?

There are three main questions I would ask to see if the solution is valid. After using the program can a child:

1. Now sit at a computer and successfully click the start menu button?
2. Successfully type its own name?
3. Successfully follow instructions given by a computer?

If the answer to all of these questions is YES then I have succeeded in what I set out to achieve.

How will the solution be tested?

Once all error testing is complete I will a variety of users to try the software. These will include experienced computer users, older beginner users and also two five year olds (relatives). This will allow me to see how different people react to the software. Paying more attention to the five year olds I shall ask them to undertake the tasks above (1-3), to validate the criteria.

Alternative Solutions

As there is no present system to work from this is basically a prototype. I do not expect it to be perfect but a system to work from. I will take ideas from other software of the same type but this piece of software will not be based on these other programs.

I feel that at this late stage I do not have time to learn a new programming language. I used UniComal in my higher course and feel that it is certainly not suitable for children/young users to use, as it is command driven. Ideally I would have liked to learn and use Macromedia Authorware, but teaching and time allowance are not on my side.

Therefore I have decided to use Microsoft "Power Point". I have access to it and I already know how to use it. It seems a sensible choice in the circumstances. I will include a section in this report entitled "Advancements" where I will include a list of ideas that I have had and how I would have liked to include them, and will look into if I decide to make the software just for fun.

Questions to ask

1. What do I have to include?
2. How much time do I have to learn a new environment?
3. What terminology will a child understand?
4. Do I have to include a parental section?
5. How can I hold a child's attention?

Alternative Solution

Several solutions including Power Point, Macromedia Authorware, UniComal, Visual Basic, all the way to a manual and exercise booklet for children to work through.

1. The idea of an Exercise booklet for children to work through. Pen and paper style. I have ruled this idea out, as although children would learn from it, it does not give hands on experience, which I feel is necessary in learning computing skills. It also might not hold a child's attention and may be found to be boring.
2. The idea of using UniComal seemed a great idea in theory as I already new the basics of the environment. Enjoying my higher course I was keen to again use the language in a more advanced way. Practically, using a command driven language certainly wasn't child proof. I felt I would struggle to keep a child's attention. This again applied to visual basic; having used it in my standard grade course I could see the potential. Better than UniComal, I could see I could do more with it, it was more user friendly, but just not what I was looking for.

3. Using macromedia Authorware was my ideal choice. Having browsed through the software I was surprised how user friendly it was. Although I could see it was going to take a lot of time to familiarise myself with it. If time had allowed me I would certainly have tried authorware. It had seemed perfect for my application; I could include sound, a scoreboard, links were automatic and its potential was amazing
4. For time allowance and teaching I have decided to go along with this idea. My suggestion is to carry out how I would like my software to go on a Power Point presentation. This will not only allow me to have a prototype of what I initially would have liked my final piece to look like but will also show links and documentation. In Power Point I will be able to use colour, sound and graphics, out of reach in the likes of UniComal and Visual Basic. This makes it more appealing to young users. As I already have an extensive knowledge of Power Point I will only have to refresh this. However, in reference to 1. , Users will have to have access to a multimedia computer.

My suggestions to go along with the fourth option are feasible as there is sufficient technology available; it is economically feasible as everything that I need as already assessable.

Software Design

Opening Page

The opening page to my project will be a general introduction. Basically its purpose is to give the links to the activities and also to the parental page. The main characters for the whole project will first appear here. In an ideal world I would have liked for him to speak as well as the words be on the screen as children may not be able to read them.

Opening Page Design

1. Show Opening Screen (Time Hold 10 Seconds)
2. Enter choice
 - 2.1 IF choice = Mouse Movement
 - Open Mouse Movement
 - IF choice = Keyboard Skills
 - Open Keyboard Skills
 - IF choice = Parental Information
 - Open Parental Information
 - END IF
- END IF
- END IF

Mouse Movement

The mouse movement screen will be very colourful. As it is the first activity a good impression must be made to encourage the user to continue using the software. The first screen will be Daffy Duck describing the game and telling the user what to do. This will be on a time hold for ten seconds to allow the user to read the information before automatically progressing forward. This is also beneficial as the whole point in the exercise is to learn how to use the mouse, therefore I don't want the user to have to click to enter the page. The following exercise would therefore be pointless if the user already knew how to do this.

The screen will only move on if the correct colour is selected. If the wrong colour is selected, a try again screen will appear and a time hold will apply before moving back to the previous screen. If the correct colour is selected then a well-done screen will appear, a time hold and then a progression on to the next colour.

Once all the colours have been completed a closing screen will appear. This will have a small picture of the main character and then will automatically go back to the opening page.

Mouse Movement Design

1. Show Mouse Movement Screen (Time Hold 10 Seconds)
2. Show Blue screen
3. Enter choice
 - 3.1 IF choice = Blue
Show Well Done
ELSE
Show Try Again
(*Previous page*)
END IF
4. Show Yellow screen
5. Enter choice
 - 5.1 IF choice = Yellow
Show Well Done
ELSE
Show Try Again
(*Previous page*)
END IF
6. Show Red screen
7. Enter choice
 - 7.1 IF choice = Red
Show Well Done
ELSE
Show Try Again
(*Previous page*)
END IF
8. Show Green screen
9. Enter choice
 - 9.1 IF choice = Green
Show Well Done
ELSE
Show Try Again
(*Previous page*)
END IF
10. Show Pink screen
11. Enter choice
 - 11.1 IF choice = Pink
Show Well Done
ELSE
Show Try Again
(*Previous page*)
END IF
12. Show Closing screen (Time Hold 10 Seconds)
13. Show Opening Page

Keyboard Skills

Keyboard skills will take the same form as Mouse Movements only obviously it will describe the keyboard skills activity. The same process will take place; the screen will only move on if the correct word is typed. If the wrong word is typed, a try again screen will appear and a time hold will apply before moving back to the previous screen. If the correct word is typed then a well-done screen will appear, a time hold and then a progression on to the next word.

Once all the words have been completed a closing screen will appear. This will have a small picture of the main character and then will automatically go back to the opening page.

Keyboard Skills Design

1. Show Keyboard Skills Page (Time Hold 10 Seconds)
2. Show Cake Page
3. Enter word
 - 3.1 IF word = Cake
Show Well Done
 - ELSE
Show Try Again
(*Previous page*)
 - END IF
4. Show Ball page
5. Enter word
 - 5.1 IF word = Ball
Show Well Done
 - ELSE
Show Try Again
(*Previous page*)
 - END IF
6. Show Apple page
7. Enter word
 - 7.1 IF word = Apple
Show Well Done
 - ELSE
Show Try Again
(*Previous page*)
 - END IF
8. Show Telephone page
9. Enter word
 - 9.1 IF word = Telephone
Show Well Done
 - ELSE
Show Try Again
(*Previous page*)
 - END IF
10. Show Umbrella page
11. Enter word
 - 11.1 IF word = Umbrella

Show Well Done
ELSE
Show Try Again
(*Previous page*)
END IF

12. Show Closing Screen (Time hold 10 seconds)
13. Show Opening Page

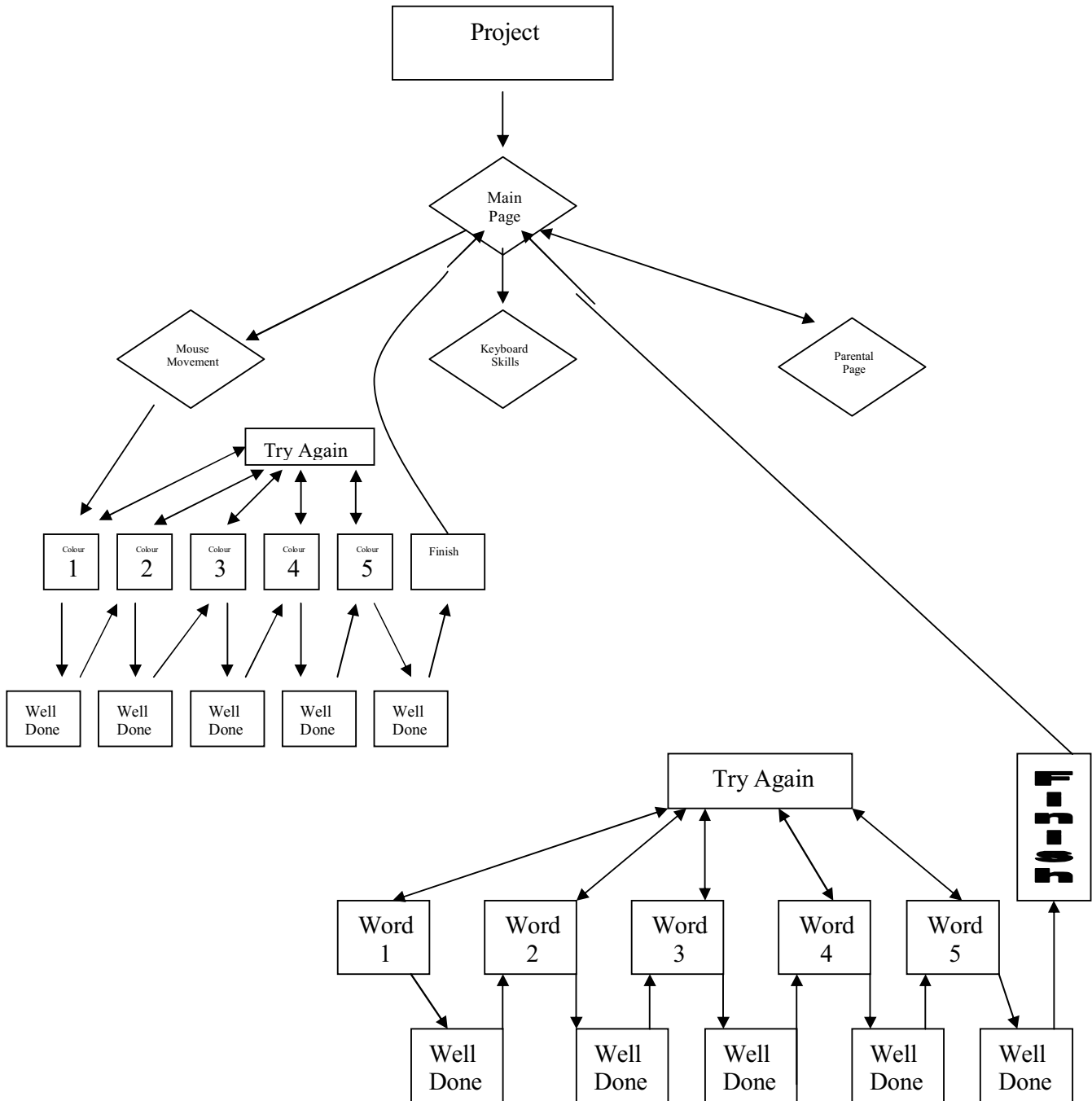
Parental Page

The parental page is a word document, basically the user guide.

1. Show Parental Page (time hold 10 seconds)
2. Open Word document "Parental Page"
3. IF closed show Opening Page
END IF

Project Plan

The basic data flow diagram represents a logical plan for the project.



Screen Demonstrations

Mouse Movement opening page

Mouse Movement (Yellow)

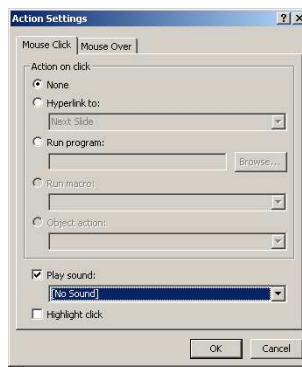
Implementing and Testing

Some time was spent at the beginning of the new school year looking into the project, since then, up until now this is it just being started. With only two teaching periods a week at was difficult to get the project off the ground. Initially I had plans to use Macromedia Authorware to carry out my project, but since I have been left with a mere two weeks to complete all the project and write up I have decided that a prototype presentation on Microsoft Power Point would basically “have to do”.

Implementing

Implementation of the solution started in mid April. Due to the time deflect shortcuts were taken to enable me to complete the project. Implementation was fairly straight forward as it merely consisted of creating the designed pages on the screen. I had big plans, and am gutted at having to reduce these for my final piece. I have a great imagination and love experimenting to see what looks and works best.

I had already drawn out all my page layouts. I then basically had to enter this into the computer. I changed my design slightly and decided to have an opening page for every separate activity. I went through each activity systematically inserting slide after slide. After one activity’s slides were all designed on the computer I had to put all the links into the slides. These take the form of “Action Settings” and are available through right clicking on the object that you wish the link to go from.



Sound was then recorded too using a computer microphone. This again was inserted using the action settings.

The characters and pictures that appear on the screen were all uplifted from the Internet, and copy and pasted on to my presentation. All images were found from www.google.com in the image section.

Link from the home page to each separate activity is going to be done through separate presentations that will be linked together. This will save confusion over one large single presentation.

Once all the pages were entered and suitable images entered, sound recorded and links on; it was time to check if everything was running smoothly. Having checked the run of the presentation a few times I could see that this was indeed going to be the most difficult part of the project. As with everything nothing ever does run perfectly. My

links were dysfunctional. When Well Done was displayed, instead of continuing to the next screen my presentation was jumping to Try Again then indeed stopping running at all.

Due to the nature of the software, no test data as such was employed. However a dry run-through is needed from different circumstances and answers. EG correct answer chosen, wrong answer chosen, to ensure that I had fixed the presentation from wandering through unnecessary slides.

Problems Encountered

I have been lucky that I have not hit many major problems and although the presentation is far from finished I can see that it is a matter of following the routine I have been doing, testing as I go along so as not to have progressive mistakes. My main problem as you can tell has been time. Everything has been rather rushed. I had great plans at the beginning and was not prepared to concentrate on one area only but to try hard to do everything. This has been a disaster. For the time it has taken to write the report has left me nearly no time to neither concentrate on the actual presentation nor study for the exam.

As I worked with Power Point it is fairly idiot proof any mistakes I made were easy to fix. My links will work with a little time and effort.

Testing

Once all link testing is complete I will have a variety of users to try the software. These will include experienced computer users, older beginner users and also two five year olds (relatives). This will allow me to see how different people react to the software. Paying more attention to the five year olds I shall ask them to undertake the tasks above (1-3), to validate the criteria.

There are three main questions I would ask to see if the solution is valid. After using the program can a child:

4. Now sit at a computer and successfully click the start menu button?
5. Successfully type its own name?
6. Successfully follow instructions given by a computer?

If the answer to all of these questions is YES then I have succeeded in what I set out to achieve.

So far I have yet not had the time to complete all of the presentation. Therefore I cannot go on to this stage as yet. I understand and have ideas of how this would work and do believe that if I had given this presentation, fully completed, to my five-year-old sister she would fully understand and enjoy it. I believe that it would meet the criteria set in my proposal: I intend to produce a piece of software to enable young children to establish the basic computer skills as a foundation to their IT learning.

What I would have liked to do if time had allowed!

1. Used Macromedia Authorware as the software package to implement my own software. (Time restriction made it near impossible for me to learn how to use Authorware. I wish that I had learned how to use it as Power Point was too basic for what I had intended to, and to be frank it was really no fun to work with. I have learnt though that there was a lot more to it than I initially thought, for example I did not think that I could incorporate sound using Power Point but found that by using "Action Settings I could not only have pre-recorded sound effects, like applause, but could also transfer files, like MP3's or in my case voice recordings. Good for future reference.)
2. I would have liked to include a scoreboard, to enable me to record the users input and also for the users benefit of finding how well they done. (With the way I have my slides and links at the moment I realise that this would not be possible, as the user must select the correct answer before moving to the next slide.)
3. To add to the contents I would like to have had more activities, for example Maths skills, drawing and design skills. Not only would this add variety but also reinforce use of the keyboard and the mouse. Skills already practised throughout other activities.
4. I seen a curser on a Disney website a while back, it had trailing coloured circles. I thought of adding that thought it would make the software more child friendly.
5. I have a few ideas from Microsoft Creative Writer, where by the user can choose to have music playing while they work. I thought this would be quite fun. EG the user could choose from different pop songs to listen to while they learn, like Brittany Spears or Atomic Kitten.
6. In Keyboard skills I would have liked the user to choose a level, the harder the lever the longer the word that they have to type.
7. In both activities I would have liked a timer so that there could be a time limit on clicking or typing.
8. In mouse skills I would liked to have had a censor areas around the colours so that if the user missed the colour it would be classed as wrong, since the whole activity is about accuracy.
9. To have an escape button so that the user can finish the activity without completion.


Technical Guide

Your Guide to trouble Free Learning

Parental Section

Your software includes a parental page to help you solve any problems that you may have during your learning experience. It is geared towards adults to allow you to solve any little glitches and to allow you to see how your child will learn.

System Requirements

- Windows® 95 or higher
- 450 Mhz Intel® Pentium processor or 500 AMD® Athlon™processor
- 128 MB RAM
- Microsoft Power Point 
- Keyboard
- Mouse

User's Manual

Basic User Interface

The Software uses a Graphical ser Interface (GUI). This GUI makes use of a pointer device (such as a mouse) and a button (left mouse button). These two together will allow the user to make choices.

THE USER INTERFACE IS KEPT CONSTANT THROUGHOUT.

Navigation

Each page is opened by navigation through the opening page. Click on the activity you wish to do and the software will open up the correct application for you. At present there is no way of escaping the application without correct completion.

Volume

The recording levels of the various audio clips through out the software may not be consistent; therefore it might be necessary for the user to change the volume on the output speakers accordingly.

List of References

- LEARNING - Approaches and Methods in Psychology (H) resource pack
- ADIBOO – child learning game
- Microsoft Creative Writer

Evaluation

Even if my project has been rather rushed I still feel that I have met the majority of the problem criteria and the process (if not the solution) was completed *minutes* before the deadline. However due to the circumstances there are many aspects of the project that if time was on myself could have been done a lot better. This would obviously resulted in a better overall performance.

Initially I feel I set my goals too high. If at the date the project started if I had rationally sat down and took a good look at the specification a was setting I would have realised just how unrealistic actually designing, making and writing up the project would have been. Although I do feel that I have made a mighty good effort in myself to as much as I have done. Even rationally thinking about it the write up has taken a lot longer than I thought it would.

I feel that I have made a conscious effort to include as much as possible and have tried to see the software from a psychological approach to enable me to focus on the actual learning rather than the skills available. I feel I have fulfilled my objective;

- I intend to produce a piece of software to enable young children to establish the basic computer skills as a foundation to there IT learning.

On a negative approach I feel if I had worked during free periods without teacher help I would have managed a much better attempt. I felt it really hard to get the initial stages of the project off the ground. I have treated S6 a little to lightly I have come to realise. Too many nights out resulted in slacking on a school day and too many games of cards resulted in not much getting done on those oh so useful free periods. Now the library is packed with Sixth formers piling in to make those critical conditional offers from university. And Belmont's three Advanced Higher Computing Buddies spend the sunny Easter Hols behind the screen of their laptops, typing away. I do feel I could have done a lot better if I had given myself more time. We were sent to Prestwick Academy to complete the course at the end of March, as our school had no Computing teachers due to ill staff.

I have found myself struggling at many aspects of the advanced course. It has been a large jump from higher to say the least.

My hopes of a 'B' are over, but at least I can say that I tried.