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Bugged Out

Online Computer Assisted Learning Package

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Introduction

As society is becoming increasingly technological, children must be encouraged to learn computing as they do any other skill and as a result, computing needs to play an essential part in the United Kingdom's National Curriculum.

The intension of this project is to create a fully working and integrated CAL package for primary school children working at key Stage Two (year Six) within the National Curriculum to aid them in this transition to the Internet age.

By using hypermedia as part of the United Kingdom's National Curriculum, learning can become more enjoyable rather than the traditional method of copying text word for word from a black board. Children could potentially be shown animated tutorials and have input into the pace and depth of understanding of their subject by being able to integrate with the software package.

United Kingdoms National Curriculum

The National Curriculum is a set standard of rules and regulations that all schools must adhere to and is split into different age categories known as Key Stages. The National Curriculum comprises of a list of subjects that must be covered by the schools covering Maths, English and Science as a few examples. Within each subject, the schools must cover certain topics and advance the children's knowledge to the required level.

The aim of the National Curriculum is to develop children to deal with cultural issues later in life and endeavours to prepare them for the responsibilities, opportunities and challenges life will inevitably pose.

Key Stages

There are four Key Stages in the National Curriculum and at the end of key Stages One, Two and Three, the pupils will then have to take tests commonly known as SAT's. At the end of key Stage three, they will then take their GCSE's.

At key Stage Two, Statutory Assessments (SAT's) will include Reading, Writing, Mathematics, Mental Mathematics and Science. This project concentrates on Key Stage 2 (Years 10-11) Biology.

National Grid for Learning

The NGfL is an online portal offering a network of websites that offer a high quality standard of content defined by the NGfL for all educational users from the learner to the educator, parent or guardian. This projects aims to comply with NGfL's standards.

The NGfL is funded by the Department for Education and Skills (DfES) and is managed by the British Educational Communications and Technology Agency (BECTA) ensuring that high standards are maintained.

The NGfL is a free portal for Information and Communication Technologies (ICT) in all areas of the National Curriculum, allowing teachers and learners to use these sites as an online resource for ICT in schools.

To ensure this project fulfils its educational requirements and achieves its purpose, it will be developed in close contact with Ysgol Parc-y-Llan Primary

School, which is set in a rural part of North Wales and is a target audience typical of its final intention.

Computer technology is making dramatic advances and this project intends to explore ways to further enhance children's ability to learn in the Internet age.

Literature review

What is Hypermedia?

Hypermedia has been in the making for many years and started with hypertext around 1938, where it was traced to writings of Vannevar Bush and Theodor Nelson (Alessi & Trollip, 2001).

Hypertext was aimed at a purely text based methodology of being able to create links off text to other relevant information. As technology has progressed, so has this methodology, progressing in to what we now know as hypermedia, allowing the user to access almost every media necessary, making hyper media an extremely powerful teaching tool (Alessi & Trollip, 2001).

Hypermedia is a method of learning using a mixture of medias. As an example, text and audio, namely dual coding, can be used which allows any two of these methods of communication to be selected as considered relevant in the teaching of others (Alessi & Trollip, 2001).

Hypermedia enables the user to find information in a non-linear structure, jumping from each subject matter in an ad hoc manner, bypassing subjects they already understand. To do this, the package chosen for this software must be able to pull relevant data from a given database on demand and displaying this data in a well-structured manner (Alessi & Trollip, 2001).

What makes hypermedia new media?

Hypermedia is ever changing and remains up to date by exploiting modern technologies in computing and telecommunications. It is an interactive medium thus requiring input from the user in order for it to work. Hypermedia is a non-linear method, and given that it has no beginning, middle or end, the user can

navigate anywhere he/she desires, making it more flexible than the traditional textbook. Hypermedia brings together many different types of media, mixing them together in a way that no other media can, creating an effective learning method.

Hypermedia already available

There are lots of packages using ICT, but very few use ICT for teaching science, especially at Key Stages One and Two. It has been said that schools with good ICT provision have better levels of achievement at Key Stage Two than schools with lower levels of ICT and only One in Three schools use ICT for supporting science (Blatherwick, 2001). It is therefore the intention of this package to help improve Learning at Ysgol Parc-y-Llan.

Use Hypermedia with care

Hypermedia is a very effective way of teaching and learning, but it must be used with care because no matter how many simulations this programme may contain, hands on experience should never be replaced, only enhanced. It is for this reason that the final artefact of this project will only be a supplementary element of the schools learning process.

Learning theories

There are three different physiological principles, Behavioural, Cognitive and Constructivist (Alessi & Trollip, 2001). All three have a different view on teaching and learning and not all believe that hypermedia is a positive learning methodology.

There are many different theories about learning, some which complement each other, others which conflict, (Alessi & Trollip, 2001) but by taking these

differing theories and theorists into account, this artefact aims to comply with most ideologies in order to create a very effective final piece.

Behaviourist

The Behaviourist Theory is based on animal and human learning; a method of learning based on observing and adopting new behaviour. A prime example of behaviourism is Pavlov's observation of dogs salivating when eating or believing that they are about to be fed when they hear a bell (Phillips & Jonas, 2002). A study proving that animals are programmed and pick habits up as they develop. This theory is based on the belief that if a stimulus is rewarded then that stimulus will grow stronger and more probable. Teachers who reward or punish pupils for their behaviour use the behavioural theory.

Vygotsky and Social Cognition

The Social Cognition learning method states that culture is the main entity that determines a persons learning. This theory suggests that children are very much affected by the environment in which they learn, their family culture and other aspects of their daily lives. (Vygotsky, 2002).

Children can often perform tasks that they are usually incapable of with a little help from an adult. To use this theory to its best advantage, a method called scaffolding can be adopted. This is where an adult continually adjusts the level of help that is offered to the child. As the child develops, they will need to continue to work equally as hard to reach their goal, this prevents boredom and will instil the necessary skills for independent problem solving (Vygotsky, 2002).

Piaget

This is a cognitive theory, which states that children learn in stages and form mental maps alongside physical experiences within their own environment (Piaget, 2002). Piaget also states that children develop by performing tasks, from the most simple such as crying and sucking to more complex activities.
Piaget's theory states four stages in developing, the four stages are:

1. *Sensiormotor stage* (Birth – 2 years old) This is the stage when the child does not know what is real and what is really possible and they have no concept of the real world. By observing their parents and other humans the child will copy and learn how to carry out tasks by copying adults.
2. *Preoperational stage* (ages 2-7) The child is still not sure what is real and what is not and needs concrete situations to make them realise what can and cannot be achieved.
3. *Concrete operations* (ages 7-11) As the child's physical experiences build, they start to place things together and are able to work things out for themselves and abstract problem solving is also possible at this stage such as arithmetic equations.
4. *Formal operations* (beginning at ages 11-15) By this stage the Childs cognitive structure is like that of an adult's and can include conceptual reasoning.

Through analysis of this theory, it is apparent that children within the target age of this artefact are at the age where by they are capable of piecing things

together and abstract problem solving is a possibility and by no means beyond their reach.

Observational learning

Observational learning is when the learner observes the behaviour of a model and then changes their own personal behaviour to that of the person whom they see as a role model (Bandura, 2002). The observer's behaviour is reinforced more if they see that the models behaviour is highly rewarded. This way they will know that it is good thing to copy. If the model is punished then the observer will know to avoid this behaviour (Bandura, 2002).

Control theory

This theory is proposed by William Glasser and states that behaviour is never a response to a stimulus, but is in fact as a result of a persons wants or needs, such as power, love or any other human need. This theory states that the user will not learn if they believe that the user cannot relate what they are being told to a real life need (Glasser, 1990).

Right Brain V's Left Brain

This theory states that the brain is split into two halves and that each half is used for different activities such as art or arithmetic. To make something whole brained, a task must use both sides of the brain. Hypermedia is particularly effective in aiding the learning process due to the range of medias that it offers, which can exercise both sides of the brain, therefore making Hypermedia whole brained (McCarthy, 2002).

Metacognition

Metacognition is the ability to be able to learn how to learn. Children must learn how to learn before anything else. This can be carried out in a variety of ways and an example would be taking notes and then reading over them later. This artefact should be a helping hand towards metacognition (Alessi & Trollip, 2001).

Teaching methods

There are many different methods of teaching and to keep the attention of a child, the chosen teaching method must be varied to prevent boredom. There are a variety of different methods a teacher can use to keep a Childs attention and by varying the methods and level of difficulty, the teacher will be making the work suitably harder for the learners (Alessi & Trollip, 2001).

Aesthetics

Text

According to a study carried out by the University of Reading in the Department of Typography and Graphic Communication on both font Gill and Century, it was determined that Gill is the most successful. This study used the expert opinion of designers and publishers and carried out performance testing on children to see what errors children made using different fonts. They also took into account the opinion of how the children found and described differing fonts. This part of the study showed Gill and Century to be equally successful. The font Gill however, has the most simplistic of letter shapes. Reading University stated that children who spot the difference between the two typefaces prefer the non-infant characters (Walker, 2001).

Hypertext

Hypertext is a non-sequential based type. Vannevar Bush dreamt this initially in 1945, but it was then named hypertext in 1965 by Ted Nelson. Hypertext allows people to navigate from different sections of text to text of more interest or relevance. The user to is able to move from A to D then to B for example. The difference between hypertext and hypermedia is that hypertext is purely text based whereas hypermedia links with any form of media, from text through to animation (Nielson, 1990*).*

Human Computer Interaction (HCI)

Human Computer Interaction covers all aspects of the hypermedia programme and explains the way in which the user interacts with the software. Methods of layout and colour as two examples can affect the way in which material is perceived.

Human Computer Interaction is taken into consideration to ensure that the target user is able to navigate and understand the programmes on any system. A poorly constructed application could lead the user to find him/herself lost within a programme, which could mean the user fails to find their desired information, resulting in displeasure and a loss off interest. In the case of a learning package for children, all HCI aspects must be covered. Precision and consistency must be maintained throughout the whole of the software (Dixx, Finlay, Abowd, & Beale, 1997).

A successful interface becomes invisible to the user with ease of navigation to the required information. An unsuccessful interface can result in the user

becoming so preoccupied with trying to use the interface that they pay little attention to what they should actually be learning (Cotton & Oliver, 2002).

Colour

The use of colour in any hypermedia package is of primary consideration as it is the first aspect noticed by the user and must therefore suit the package and the target audience. The colour of the interface must not be too obtrusive to the user. The use of a blue background for example should be used in this programme given that the human eye has less blue colour receptors than any other, making it the most relaxing colour for the eye (Dixx, Finlay, Abowd, & Beale, 1997).

Imagery

It is essential that images be used in the correct context given that "A picture can paint a thousand words". All chosen images need to be tested to determine what meaning they have to the target audience.

In one individual picture it is possible to portray a whole story and as Sergei Eisenstein pointed out, if you place two images juxtapose it is possible to create a whole new meaning with the images (Cotton & Oliver, 2002).

Images are becoming more powerful with the youth of today as they develop in a world of imagery seen on the Television, on the computer or on Games consoles, more so than the elderly who grew up in a more text based orientated world.

The challenge seen when using images is that they take up more space than text. This can slow the down load time for online applications and decrease the

quantity of information if there is a storage limit, which can be seen with CD-ROMs with a limit of either 650MB or 700MB. By using too many images, it can restrict how much space is left for text (Alessi & Trollip, 2001).

Metaphors

The use of metaphors can be very powerful in hypermedia. By using metaphors, it is possible to make certain aspects of an interface stand out. A left to right arrow usually means play or a green light means go for example. Most metaphors are chosen subconsciously by all ages (Woodhead, 1990).

Simulations

Simulations are very powerful means of teaching real life situations and are renowned for being more interesting and motivating than any other methodology. Simulations are used to carry out experiments that can not be carried out safely in a teaching environment or if for example a school can not afford the equipment and materials to carry out different scientific experiments (Alessi & Trollip, 2001).

Simulations can work in either of two ways, in a fictional or non-fictional format. Teaching the non-fiction method is considered best as children can relate it to real life situations and should see the reasoning for carrying out such simulations (Alessi & Trollip, 2001). Engineering and research simulations should be as close to the real thing as possible (Ducastel, 1994).

Games

A Games environment enables a child to learn without realising, making teaching easier and creating a subconscious desire to learn as the child continues to play games in order to improve their performance, when in fact what

they are actually doing is improving their knowledge and revising at the same time (Alessi & Trollip, 2001).

Teachers often misconceive games because they see them purely as a game rather than a method of learning. In order to overcome this, it is essential that there is a clear goal to the game and learning objectives can be seen by teachers and other on lookers (Alessi & Trollip, 2001).

Usability for children

According to a study carried out by Jakob Nielson (1990), children like colourful design but at the same time demand simple text. Children are incapable of overcoming usability problems and the name of each page is important so that the children continually end up at the same place, preventing them from becoming lost in the package (Neilson, 1990).

Links on a web page must look visibly easy to select with the mouse, rather than using a flat screen, although children, curious by nature, will be willing to search web pages for more links and sounds in any case. If a site contains banners, children will click on them not realising that they do not form part of the site. This use of the Internet must form part of a separate lesson (Neilson, 1990).

Content on a children's website should be unobtrusive and easy to navigate within. Drilling down to find information can lead to boredom and can result in the child loosing patience. A combination of poor usability and a child's lack of patience will result in the user simply leaving the site. Location within a site should always be made clear to the user by the use of a simple, yet obvious, title on each page informing the user where they are within the package (Neilson, 1990).

Methodology

Case study

Bugged Out by Science, the online CAL Package was designed for Key Stage Two students in a North Wales school covering the subject of Plants and certain topics from within the United Kingdom National Curriculum.

The package was designed for supporting lessons that had already taken place and acting as revision for the pupils allowing them to revise at their own pace and reviewing topics within the subject that they desired.

Learning Objectives for Bugged Out

The main learning objective of Bugged Out was to enable the users to recall information a quickly as possible and to give the users a wider variety of learning methods so that they can recall animations to help them remember the way things happen by use of simulations.

Bugged Out also aims to teach the users how to learn by taking notes as they make findings. This is why Bugged Out has a note pad that the users can print out at the end of each session so that they can revise their findings.

Prior knowledge

Before designing the package it was found that the users had Internet access on their computers and were already being taught about plants. Therefore on completion of Bugged Out the users would already have knowledge of the topic area and would be ready to revise the subject and possibly refresh their knowledge ready for their SATS.

Layout and usability

From research carried out into the usability for children it was obvious that the layout must be consistent and navigation must be obvious. This is so that the users do not have to spend time learning how to use the package when they should be learning about the subject areas covered by the package.

The users for Bugged Out already had knowledge of Microsoft Window and Microsoft Office for creating word documents and charts. Therefore it was decided that the use of separate windows for each section would be the best option so that the layout would seam familiar to them.

For the navigation, a bar was created at the bottom of the package where the buttons are animated. This draws the attention of the users so that they should not need to search for navigation, as it will be made obvious by the movement. The buttons used for Bugged Out Science do not tell the users what each one is until the users rolls over them thus not creating too much of a challenge, but also making the package too easy for the users and therefore losing the attention of the users.

It was decided that more than one user may wish to use the package at the same time, from the same machine so the option to choose how many players wishing to play was added. There is a limitation of three users due to the decision that more than three users to a computer would not be comfortable.

Each user gets to enter their name into the package giving them the feel that they are in control of the whole package and giving it a personal touch as their names are displayed at the top of the screen.

Due to the fact that the users would not have any guidance from the teacher whilst using the package, it was obvious that the package must give intrinsic feedback to the users telling them where they have gone wrong, and what to do about it. This allows them to go back and revise topics that they are lacking in knowledge, or the correct information is given to them straight away when the mistake has been made. By giving the users positive feedback it is believed that the users will be encouraged and then wish to go on and learn more.

What tools are best for creating hypermedia?

Given that hypermedia incorporates such a variety of medias, it is necessary that the correct software is used to compile the different medias together. The software best adapted to perform this task requires high degree of knowledge in computing and programming, which is not a skill set most schools will have with in their work team.

There are many software packages on the market that can be used for creating hypermedia packages, some better than others. The most appropriate package also depends on how it is going to be delivered, be it on CD ROM or via the Internet, some software suits different methods better than others.

Further packages may also be required if video or audio is desired as part of the hypermedia programme. Video and audio production skills will also be required in this case, further adding a specialised set of skills.

Methods of Multimedia distribution

There are many ways of distributing multimedia to a large audience all of which have advantages and disadvantages. Below is a table of the different methods and their advantages and disadvantages:

Method	**Advantages**	**Disadvantages**
HTML	• Simple to learn. • Cheap. • No Plug in required. • Font settings can be changed to suit the user. • No special authoring software required.	• Very basic. • Complex interactions are complex tasks. • Hard to offer a good range of medias.
Shockwave	• Allows High quality of media. • Good multimedia capabilities. • Complex interactions. • Data streaming. • Quick download time for amount of media.	• Requires a plug in. • Requires authoring software. • Requires a lot of skill to programme.
Flash	• Allows High quality of media. • Good multimedia	• Requires a Plug in • Requires authoring software.

	capabilities. • Complex interactions. • Data streaming. • Quick download time for amount of media.	• Requires a lot of skill to programme.

Structure

There are two ways in which a CAL package can be structured, these are Linear and Non-linear and depending on the subject and content one or the other should be decided on.

Linear structure is when the users can only follow through the package from start to finish like a book which most children would not find interesting and would soon loose interest.

Non-linear structure is when the user is able to decide for themselves where they wish to start and finish, like an adventure book where you don't necessarily go from one page to the next. At the end of a chapter you can decide where to go to next and the output can be different for many users. Non-linear structure is created by using hypermedia, which Bugged Out Science is all about, using different medias from text to animation allowing the users to go from one section to another as desired thus keeping the attention of the users.

Narrative

To make Bugged out more interesting it was given a story about an evil doctor who is going to destroy every plant in the world. The chosen character

(Bugman or Bugwoman) need help from the users, thus learning everything they can from the links to help them stop the evil doctor (figure 1).

Figure 1

By using this story it is hoped that the users will feel learning about plants is like an adventure and they are learning it for a reason rather than simply listening to the teacher.

Functionality

Bugged out has been built up of different sections and each section has been built as a separate movie. By doing this it means that the initial download speed will be a lot quicker and the users will not have to wait to long before using the package.

By building each section as a separate movie it means that it is a lot easier to create each section and also to update, as there is a lot less data to work through in each section.

The whole package fits together by having the main movie load in each section separate from the server so their will be a small download time for each section. To try and decrease the download time, a preload JavaScript will be added to the page so that the whole site starts downloading the additional movies, even before they are requested, just the same as when using rollover

images so that the user does not have to wait for the second image to download on rollover defeating the object of rollovers.

When the users have finished they have the option to logout so that the whole package is reset and ready for the next users to start. It and also adds to the feeling that the user is really in charge. When the users clicks to logout they are first asked if they are sure and if so they are taken to a screen that tells them they have Bugged Out (logged out). This then times out back to the beginning ready for the next users.

Design considerations

To make bugged Out a success with the target audience every aspect of the design had to be perfect and have an appealing genre for the target audience. In the initial stages the target audience was viewed as being younger than they actually were. Originally an extremely simple interface was created with an extremely simple character called Oli who was a 3D spider who would guide the users throughout their learning experience.

After meeting some of the target users it was obvious that the initial design concept was not going to work so research into magazines and television cartoons etc was carried out to develop a new concept, a concept that should wow the users and give the package a more up to date appeal.

The characters

The characters where created after viewing lots of children's magazines and trying to find the ideal character for the package. Once a genre was decided upon it was then a challenge to design a new unique character for Bugged Out,

one that would also fit with the name Bugged Out, so it was decided a super hero type character with a bug like appearance would be suitable.

The bad guy of the package does not have much to play, but does give a lot towards making the user want to use the package, so also needed to be considered a great deal. Again after viewing lots of magazines it was decided that the main bad guy was usually of human appearance and tended to be a doctor so this was how Doctor X was dreamed. Doctor X also needed to look slightly scary and very strong to suit the part of a bad guy.

Colour

The colours throughout Bugged Out have been kept as bright and cheerful as possible to create a happy and fun environment. The main background colour chosen for Bugged Out was blue (figure 2). Blue is the most relaxing colour on the eye as a background colour due to the small amount of blue colour receptors in the human eye (Dixx, Finlay, Abowd, & Beale, 1997).

Figure 2

Fonts

The fonts used for Bugged Out were considered as very important as the users of the package are not of the best reading ability. Therefore the correct font

was important to ensure that reading content was carried out easily and did not take away any of the learning factor from Bugged Out.

It was decided to use Gill Sans MT as the main font as this was found to be one of the best fonts for children's reading and enabled easier and faster reading by pupils (Walker, 2001).

Activities

To encourage the users Bugged Out has incorporated a small range of games at the end of the sections so that the users are rewarded for their learning. Each game has a hidden lesson involved such as Hangman, where the word to find is Photosynthesis, which is an important word for the users to remember. Some users may struggle to remember this word, but by playing Hangman the users should be more successful in remembering.

Games used

Bugged out uses five different games all of which give a hidden lesson to the users. The games used are Hangman, Jigsaw, Quiz and Word Drag and Drop.

Word drag and drop

This game entails a sentence with missing words (Figure 3). The user has to drag the correct words into the right place in the sentence, if the incorrect word is dragged to the wrong place it will not stick and will go back to its original position ready to be dragged again. This ensures the users read the sentence so that they will learn from it (Figure 3).

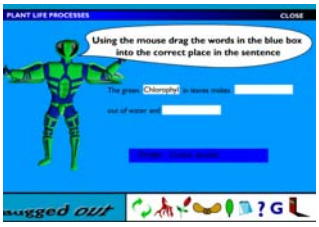

Figure 3

Quiz

The quiz is situated at the end of the Roots and stems section, which tests the users on what they have just learned. At the end of the quiz the user/users are given feed back with a result out of five and a comment from the Bug Character. The result determines what comment they receive (Figure 4).

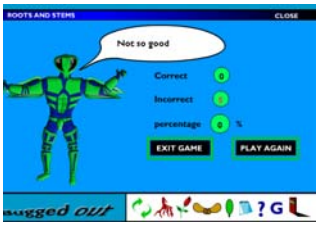

Figure 4

Hangman

Hangman is a simple fun game for the user/users to play at the end of the section and should not take long to complete. As the user/users search for the hidden word, they will be trying to think of words from the last section and therefore revising what they have just learned subconsciously (Figure 5).

Figure 5

Jigsaw

The Jigsaw is a small game with 24 pieces to place into a picture to reveal the same flower and it various parts that have been used through out Bugged Out. The repeating image of the plant and its different parts stay in the users memory. When the pieces are in the correct location they become 100 percent opacity and click into place. This gives the user/users feedback that the piece is in the correct position.

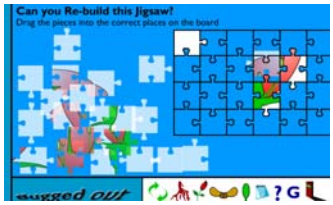

Figure 6

Help and Glossary

The user/users have not used Bugged Out so may need help. There is a help window for the user with simple help facts to try and answer any questions that may be asked by the user or the guardian of the user.

As Science can use some complex words a glossary has been included in Bugged Out so that if the user/users does not know what a particular word means and they are to embarrassed to ask, they can look the word up with ease.

Teachers and parents

Teachers and parents may be dubious about Bugged Out so to answer any queries they may have a special page has been set up for them. This is to ensure and inform them all about the package, and saves them the time of having to review the package themselves for suitability.

Results

User testing

Bugged Out was continually user tested and inspected by members of Parc Y Llan Primary school, Mrs Sian Fordham, the Head Teacher of the school was keen to check on the progress of the package through all its stages of production and previewed Bugged Out before the children to ensure all content was suitable and relevant.

Parc Y Llan Primary School an IT illiterate school with only three Computers and 56K Internet connection. The only IT carried out by the school for the pupils is using Word processing and spread sheets to make graphs.

Research

The first stage of research carried out in order to help the creation of Bugged Out Science was to visit the school and meet the children who would be using the package. This was to find out what skills they already possessed and to find what resources where available to the users.

The second stage of the research carried out for Bugged Out was discussing with the teacher what subjects are being taught and topics the children are learning within those subjects, also discussed was the subject matter that could be most fun for the children if made into a CAL package.

The third stage of research was talking to the children to find what they found interesting in and out of school. This was to help define a good idea for the package how much they already knew about computers in order to produce a good idea for the package.

Finally, the books that the children were currently studying were researched to find what knowledge they should already have and what skill level they were at. This was to ensure that Bugged Out was not created to advance for the children.

Findings from the school

From talking to the teacher it was found that one of the current subjects being taught to the children was science, in particular about plants and photosynthesis. They where working from a book called Key Stage Two Science, The Study Book which covered all topics which where to be taught for this section of the National Curriculum. It was decided from this finding to work from this book for the contents of Bugged Out. This would keep all the content familiar to the children and avoid confusion.

Whilst talking to the children it was found that their main interests that could be incorporated into Bugged Out was action characters from children programs and magazines. This was not the case for all boys and girls however approximately fifty percent of the girls said they did not mind action characters so long as they were not male.

After finding the likes and dislikes of the children research into children magazines was carried out to try and dream up the ideal character for them.

User testing

A few small items where noticed during user testing. One of the main problems pointed out was that although the text was animated it was still

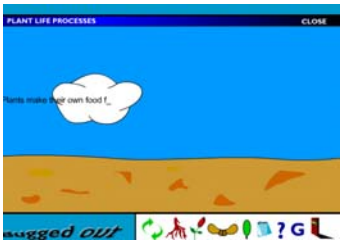

Figure 7

boring so an additional element was needed in order to add to the text appeal. It was decided to animate the text on clouds making the text seem more interesting (Figure 7). This was found to be more appealing to girls than boys.

The introduction text naming the section was found to be very boring and did not make the user/users excited about each section. A variety of animated text was added for each section to try and excite the children into using each of the sections. Each method was tested (with and without animation) and it was found that animation received a far more positive response and seemed to make the children more excited about the whole section and what was involved.

Figure 8

It was pointed out that the user is asked to select a character, either Bugman or Bugwoman yet once the user/users enter the package characters appearance was limited. The characters where then incorporated into the package more as a form of user feedback.

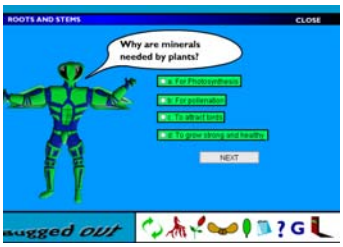

Figure 9

When testing Bugged Out with the children it was noticed that they did not use the note pad to take notes. When asked why the response was they kept forgetting, so a reminder was added from the chosen character and a red circle flashing over the note pad button.

Figure 10

At first the background for the main content windows was a darker blue but from the user testing it was found to be too dark and straining on the eyes. A lighter blue was therefore used, tested and found to be far better.

Recommendations

Future improvements

There are many improvements that could be made to Bugged Out and some that will be developed in the future. The first thing to improve would be the graphics used in Bugged Out.

Another aspect of Bugged Out that would be a great improvement, which was noted in the user testing, was a voice over. Some of the children found understanding information in from screen was difficult. If it was read out to them they would find using Bugged Out much easier. According to Mrs Sian Fordham this is a common problem with children at this age.

The overall dynamics of Bugged Out is an area that needs improving. In some areas so that such improvements will be easy to carry out in the future. Improvements include a dedicated area below the TV screen on the interface for including an overall score to increase competition between users in the classroom environment (Figure 11).

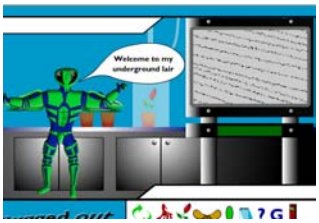

Figure 11: Main interface Score space below TV

A great improvement for the future would not only be to remember users but also which sections they have already completed. This means they would not need to go through the hassle of entering each section a second time seeing if they have completed it or not.

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Appendix

Concept document

For Bugged out

The online Science Computer Assisted Learning Package.

Prepared by Webmuppit

Bugged Out is an online learning package created in Macromedia Flash. Throughout the package you will be able to learn certain aspects of Biology including Photosynthesis, Plant Life Cycle, Roots and Stems, Seed Dispersal and Plant Organs, all of which are topics covered within key Stage Two.

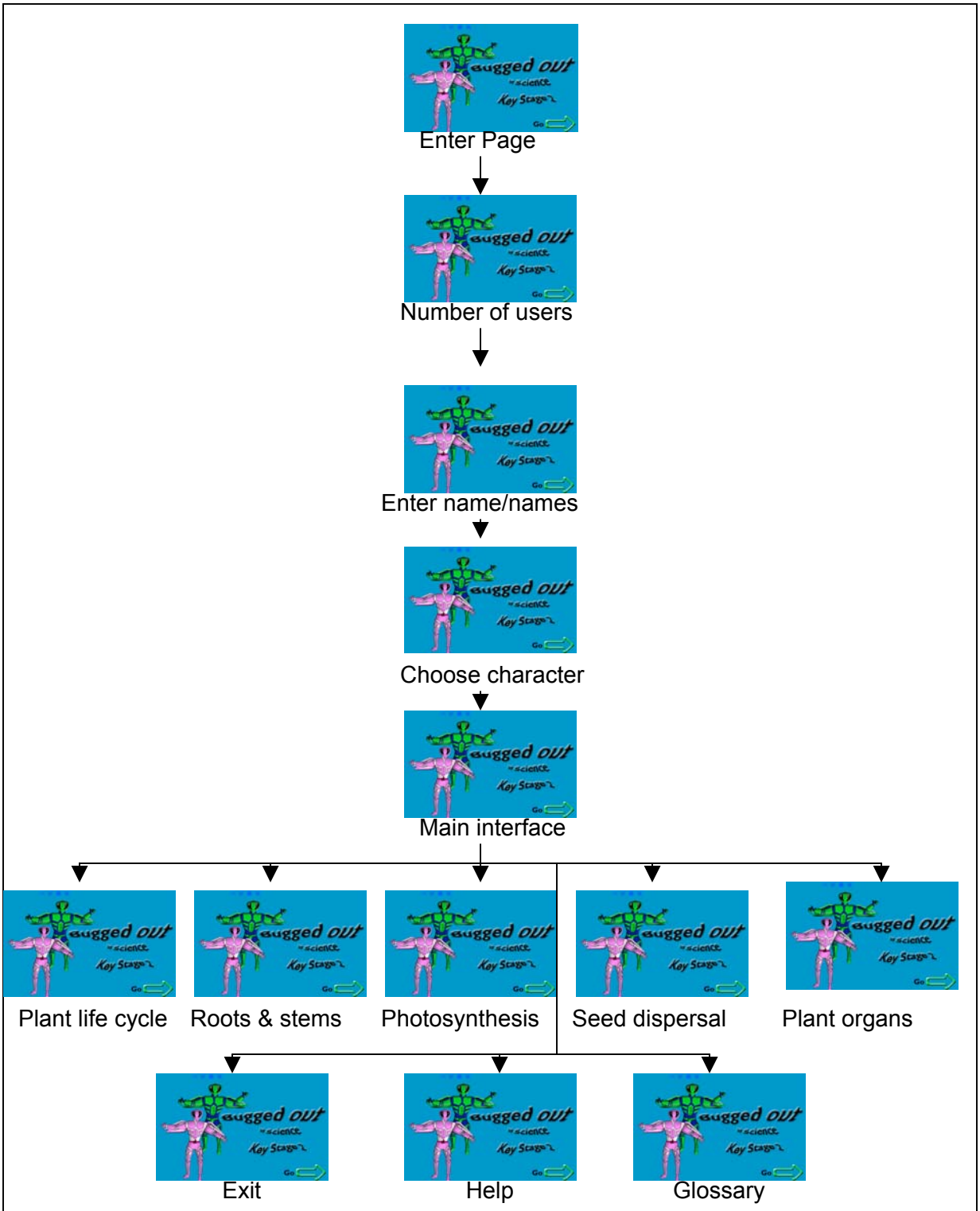
Bugged Out will allow children to carryout an animated tutorial and practice what they have learned in lessons before taking a small test. Due to the nature, and indeed the intention of this package, this should not seem like a test, but more of a game. *Bugged Out* aims to be an edutainment package.

Your hosts for this Bugged Out package are 'Bug man' and 'Bug woman', who are in the genre of super hero's, each with under ground Lairs, defending their gardens from the evil Dr X.

Bugged out will be in cartoon style so that it appeals to the target age group. The Interface, once entered into the package, will reside primarily in the underground Lairs, each a different colour depending on which character the user chooses.

Bugged out has the aim of developing the user to such a degree that he/she, through their choice of character, can go in to battle with Dr X, carrying out a number of challenges against him by putting their knowledge into use.

Node map



This diagram shows how each of the pages will link. From this it is possible to see how many and what links are needed for each page.

Assets list

Buttons:	Go
	(Players) 1, 2, 3
	Help
	Plant life cycle
	Photosynthesis
	Roots and stems
	Seed dispersal
	Plant organs
	Note pad
	Exit
	Glossary
Character	Bug man
	Bug Woman
	Dr X
Interface	Lair
	Menu Bar
	Name Bar
	Preloader
	Tutorial windows
	Note pad
	Glossary window
Tutorials:	Plant Life Cycle

- Photosynthesis
- Roots and Stems
- Seed dispersal
- Plant organs

Sounds:
- Button sounds
- Animation sounds
  - Swoosh
  - Boing

Other:
- Story line
- Speech bubbles

Programme includes:

- buggedout.swf
- hangman.sfw
- jigsaw.sfw
- lifecycle.swf
- quiz.swf
- seeddispersal.swf
- whangman.sfw
- wjigsaw.sfw
- wlifecycle.swf
- wquiz.swf
- wseeddispersal.swf
- index.htm

main.htm

about.htm

exit.htm

feedback.htm

pnt.htm

Functional Specification

This section gives a rough outline into the backend of Bugged Out by Science.

index.htm

Enter <a href=”main.htm”>

Parents and teachers <a href=”pnt.htm”>

About the site <a href=”about”>

Get Flash 6 Player <a href=”

http://www.macromedia.com/shockwave/download/download.cgi?P1_Prod_Versi

on=ShockwaveFlash&Lang=English&P5_Language=English”>

Pnt.htm

Home page <a href=”index.htm”>

Parent and Teachers <a href=”pnt.htm”>

About this site <a href=”about.htm”>

About.htm

Parents and teachers <a href=”pnt.htm”>

Home page <a href=”index.htm”>

Feedback <a href=”feedback.htm”>

Feedback.htm

Submit method=post “$Name, $Email and $message” to mail01.php

Buggedout.swf

Users 1, 2 or 3?: (*goes to relevant name input page*)

1=on (release) { gotoAndPlay("1"); }

2=on (release) { gotoAndPlay("2"); }

3=on (release) { gotoAndPlay("3"); }

User name/names?:

Input variables = name1, name2 and name3

Go = on (release) { gotoAndPlay("main"); }

(*To character choice*)

Back = on (release) { gotoAndPlay("usernumber"); }

(*Back to users*)

Character choice?:

Bugman = on (release) { gotoAndPlay("man"); }

(Go to male interface)

Bugwoman = on (release) { gotoAndPlay("woman"); }

(Go to female interface)

Back = on (release) { gotoAndPlay("usersnumber"); }

(Go to How many users)

<u>Main interface:</u>

Plant life processes = on (release) { unloadMovie (_root.moviearea);

loadMovie ("lifecycle.swf", _root.moviearea); }

(Unloads any other movies and loads chosen .swf)

Roots and Stems = on (release) { unloadMovie (_root.moviearea);

loadMovie ("quiz.swf", _root.moviearea); }

(Unloads any other movies and loads chosen .swf)

Photosynthesis = on (release) { unloadMovie (_root.moviearea);

loadMovie ("hangman.swf", _root.moviearea); }

(Unloads any other movies and loads chosen .swf)

Seed dispersal = on (release) { unloadMovie (_root.moviearea);

loadMovie ("seeddispersal.swf", _root.moviearea); }

(Unloads any other movies and loads chosen .swf)

Plant organs = on (release) { unloadMovie (_root.moviearea);

loadMovie ("jigsaw.swf", _root.moviearea); }

(Unloads any other movies and loads chosen .swf)

Note pad = on (release) { with (pad) { play(); } }

(Loads Internal movie so that it does not unload on another loading

pad = variable name)

Help = on (release) { with (help) { play(); } }

(Loads Internal movie so that it does not unload on another loading help = variable name)

Glossary = on (release) { with (gloss) { play(); } }

(Loads Internal movie so that it does not unload on another loading play = variable name)

Exit = on (release) { with (sure) { play(); } }

(Loads Internal movie so that it does not unload on another loading sure = variable name)

Female interface works the same only .swf files have a w added in front of the file name.

Contract

Design and content Sign off

Final Sign Off