

# Report on the educational use of games



An exploration by TEEM of the contribution which games can make to the education process

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## Games in education - executive summary



'Computer games' is a term that is widely used to describe many different activities on the computer. Games can be categorised into broad groups and these teacher led categorisations are comprehensible to parents.

Primary teachers perceive that many educational titles contain a game element, and this perception is shared by children using such software. The games included in this evaluation were all outside this traditional classroom software group.

Games provide a forum in which learning arises as a result of tasks stimulated by the content of the games, knowledge is developed through the content of the game, and skills are developed as a result of playing the game.

It seems that the final obstacle to games use in schools is a mis-match between games content and curriculum content, and the lack of opportunity to gain recognition for skill development. This problem is present in primary schools, but significantly more acute in secondary.

Many of the skills valuable for successful game play, and recognised by both teachers and parents, are only implicitly valued within a school context. Teachers and parents both valued the conversation, discussion, and varied thinking skills demanded by some of the games employed. However, these alone could not justify the use of the games within a crowded school curriculum.

Teachers have highlighted and indicated elements of game structure and form which would enable some of the games to be incorporated into the school context.

Children's access to games varies as they get older. Their preferences are clearly for adventure and race games and shooting/arcade though girls are far more likely to favour adventure games than boys throughout.

Overall pupils were more likely to play games on a games console rather than a PC, but most played on more than one platform and PC use only dropped below 50% for Key Stage 3 boys.

## Games in education project



### Introduction

There is a widely held view that games software is capable of developing a degree of user engagement which could be usefully harnessed in an educational context. This project was seeking to:

- ✓ Explore the notion of the computer game.
- ✓ Understand the complexity of the genres.
- ✓ Identify what if anything particular types of game might contribute to the development of learning related skills or the knowledge of content.
- ✓ Consider the match and mismatch between these skills and content and those recognised as valuable within traditional educational settings.
- ✓ Identify the likely nature of valuable collaborations between games developers and education professionals.

### Aims and objectives

#### What are we looking for?

- ✓ Data on pupil use of games out of school.
- ✓ Pupil and parent views on game playing out of school.
- ✓ Ways in which games support the learning and teaching of curriculum content.
- ✓ Ways in which games support the learning styles and skills and processes which support school based learning.
- ✓ Ways in which games can be integrated into classroom use.
- ✓ Ways in which game play can be referenced and utilised in classroom use.
- ✓ Features of games software which could usefully be harnessed and reproduced in software designed for schools.

## Methodology

### In this exercise TEEM has:

- ✓ Chosen games that have apparent curriculum relevance and/or support a relevant learning style, or develop a particular skill.
- ✓ Provided the games to trained evaluators to explore and evaluate in the classroom against a draft evaluation framework.
- ✓ Refined the framework in response to the feedback from this first phase.
- ✓ Provided a framework/questionnaire that the teachers can give to a small sample of parents, who contribute evidence on home use.
- ✓ Conducted a focus group amongst the teacher evaluators to explore the issues further.
- ✓ In addition we have distributed some 800 questionnaires to pupils in Key Stages 2, 3 and 4 and collected and analysed over 700 completed responses. In this case schools were chosen to reflect the full range of socio-economic situation as well as age range. Particulars of the schools are given in the appendix, but the schools are not named.

## Different types of software

There are lots of different ways of defining genres of computer games that are used in related magazines and amongst keen games players. For the purpose of this exercise games were differentiated by the type of activity involved in playing the game. Feedback from teachers has been an important part of the development of this classification.

## Teacher evaluation of games in a classroom context



### The games

The games selected for trial in the classroom were primarily of the simulation or quest-based genres. Some of these contained within them some arcade style games, often appearing randomly or as a reward for the successful completion of a task. Other game types (see page 8) were not identified as potentially appropriate for classroom use, even though they may have some broad educational benefits in an informal learning context.

### The evaluators









The teachers involved were all TEEM trained digital content evaluators, used to incorporating ICT into their teaching, and managing the use of computers in the classroom.

### Methodology

Pairs of teachers in different schools were asked to evaluate each title within one of the Key Stages, with a class they taught and within their mainstream teaching if at all possible. The games were used on more than one occasion over a period of the summer term of 2001.

The teachers recorded their experience using modified evaluation frameworks based on the TEEM frameworks for the evaluation of digital content (see page 39). The emphasis throughout was on the potential of the game to support learning within a classroom context, to identify learning outcomes, and to highlight management issues. This last point ensured that data collection captured the context within which the game was used and the task structure and management required to ensure the potential learning objectives were realised.

This report is a summative analysis of all the teacher evaluation reports received.

Genres of title	Key features of genre	Titles used in current evaluation
Adventure/quest games	The adventures offer a series of challenges usually within an overarching scenario. The tasks in the game may be relevant to the school curriculum.	Freddi Fish Pajama Sam Settlers IV Putt Putt enters the race 
Simulations	The player operates a model/simulation which then behaves according to a pre-programmed set of rules which may match those in the school curriculum, or those in real life or may be fantastic.	Age of Empires City Traders The Sims Sim City 3000 Championship Manager Legoland RollerCoaster Tycoon 
Race games	The player operates a vehicle around an obstacle course. It is sometimes possible to configure the course and/or the vehicles.	F1 Racing Championship Micro Racers 
Maze games	Movement in 3D or 2D space, with obstacles to overcome/ challenges to meet. Timing is critical, heavy reliance on motor-skills memory and planning.	Lego Alpha Team 
Edutainment activities	Activities structured with a view of loosely supporting education, usually a combination of activities and games with an overtly educational intent. Can range from skill development, eg hand-eye coordination, concentration, memory, problem solving, or creation of an outcome based on the content provided – video, picture, subset of an art package including product specific clip art or stamps, video library, music clips and some basic skills materials as well.	The Tweenies Bob the Builder Worms United 
Creative/ Model building	This is often a component of the game rather than the game in itself. For example some of the race titles involve creating a course, or building the car before you can race it.	This is a component of Lego Alpha Team and F1 Racing Championship Roller Coaster Tycoon Age of Empires II 
Shooting/ Arcade games	By aiming and firing at objects which are usually moving, they are destroyed. This involves the development of fast hand to eye co-ordination.	Some of the games evaluated contained arcade elements, but this genre was not evaluated per se. 
Traditional games	The player usually plays these traditional games like chess or solitaire against a ‘computer’ player.	This genre was not evaluated. 

## Features of games which contribute to value in the classroom

There was a strong consensus of opinion across key stages on many aspects of games which were important when integrating the use of the game into a formal learning setting.

### Aspects of design contributing to management in the classroom

Games varied greatly in the degree to which use could be managed in the classroom, and yet many of the desirable features identified by teachers could be implemented in many games with relative ease. This is especially so if designers take these matters into consideration at the design stage.

It is important for teachers to have some kind of record of what each group has done during a session of gaming. Few games store scores even where they are awarded, or offer a record of what has been achieved.

Games which develop the tasks within them so that there is clear progression overall are valued more highly, as are games where the level of challenge can be adapted for pupils of different ability levels. Where pupils benefit from repeat practice, games that offer non-identical repeats are especially valued. This is also true where pupils do not all play at the same time, as in a computer room, but play sequentially so that they do not always get exactly the same experience as the others. As games promote active discussion there is much sharing of information, so that pupils often know what others have done even if not present at the time. The facility to save and restart games where the player left off is important, as is support of sequential multiple users so that each group or individual can restart where they left off. This may be achieved by having a save feature which records the point players have reached, as in games with a narrative or overall structure. Alternatively the navigation of the game may allow you go to the desired part of the game on start up. This facility is very important in the management of the use of a game in a lesson context – the pupils need to be able to get to the right bit of the game without elaborate set up or working through unrelated material.

Games often take a long time to complete so use takes place in a series of sessions. Some are so complex that they take longer than could be devoted to them in the classroom. In these games suitable stopping points are helpful to avoid the dissatisfaction of leaving a job undone. Home use can support longer periods of uninterrupted use, and use over longer periods of time, than school use.

Complex games are generally more challenging and therefore offer more potential in the classroom. They do, however, throw up more management issues as well. First they are time consuming to get to know – teachers must spend time discovering information about the games structure and content through playing the game. This can include complex inference concerning whether the models used reproduce accepted conventional models and if so which ones. For example do business simulations behave according to an accepted model, and do the objects racing round a track obey the laws of motion? All this information, on structure content and underlying models could be provided in an easy to read handbook, making the adoption by teachers more realistic. Where games depart too far from realistic models their value is seriously compromised, for example one game where magic spells and sacrifices improved a village's chance of survival was deemed suspect by teachers.

In terms of operating the software it is better if the user interface is obvious and no written instructions are needed, especially for young children. Where help is needed, or important information is conveyed through text, it is vital that the reading age of the text matches the target age of the players. This is not always the case. Unlike home contexts, young pupils will usually need to be able to play the game largely independently once the task is set up. Indeed the development of this autonomy is an important learning outcome (see below). Noisy games are distracting to non-users, so where games are played in the classroom while other children are doing other work it is important to have headphones. In primary schools children often work in pairs at the back of the classroom, and the disadvantage of headphones is that it makes discussion much more difficult. Headphones are much more widely used in secondary school environments.

## Learning outcomes from playing games in school

The overall sense that quest and simulation games contributed to children's learning was universal across the key stages. The nature of the learning supported by games use could be broadly divided into three types – learning as a result of tasks stimulated by the content of the games, knowledge developed through the content of the game, skills arising as a result of playing the game. This last one can be subdivided into direct and indirect learning.

## Stimulus for learning

The use of games as a stimulus for associated work was restricted to primary schools in practice, although this is not theoretically the case. In

the evaluations such work included largely creative writing using characters or scenarios from the games. Here the high degree of engagement with the game, and the perceived authenticity of the game's context provided jumping off points for other activities. These factors could also be used to stimulate creative work in other areas such as art and design, technology, and in some cases science. In addition teachers could use pupils' extensive games experience outside school as a starting point for work in school. This would require teachers to be more aware of the importance of games in pupils' lives, and a willingness to have children contribute their expertise in these areas to the learning activity.

Business style simulations often include graphs and charts which can be a starting point for discussion and work away from the game.

### Content related learning

Games vary as to the amount of content they contain which is of direct relevance to the school curriculum, but this is generally low. Even where the context seems to be relevant to curriculum content, the contribution this made to the child's learning may be very peripheral.

“ Although I enjoyed the game, as did the children, I do not feel that there was any educational relevance from the point of view of health education or food groups. Parts of the game are set inside organs of the body in an attempt to highlight the health elements of the program. The message is not reinforced as the program goes on and I feel that the idea of food groups became lost in the game. If there is going to be any educational relevance I feel that something about the balance of the food groups would have needed to have been explored. The food pyramid was there but I do not feel that the reason for that was explained at all.

*KS 2 Evaluator*

“ Because the player is immersed in a historical time period, one would assume that there is history to be learnt from playing the game. However, I feel that the historical context is really only incidental and the students I worked with confirmed this view.

*KS 3/4 Evaluator*

Primary oriented games, designed with an educational theme, may contain some basic content (maths is especially common) but this may not be presented logically, or in the way it is approached in class. Tolerance of games with little content relevance is greater in primary schools, but secondary schools cannot afford time in class on activities which do not feed significantly into subject knowledge, even where there are related learning spin offs which are not content specific. Games with the greatest potential here are simulations, but there is concern about the models driving these, and the extent to which they replicate real world models. Even here the time needed to work on a complex simulation is much greater than the related topic would receive in the school schedule. As a result use was more likely in extra-curricular time. One evaluator used a football management simulation to support pupils who struggled with data handling and reading in extension work outside normal classes. Unsurprisingly this was very popular with male students.

### Skills games develop

There was a recognition across the age range that games support the development of a wide range of skills which are essential to the autonomous learner. Some of these related directly to the context of the game which developed skills such as problem solving, sequencing, deductive reasoning and memorisation. Others were a result of the learning context when children work in groups on a task. These included peer tutoring, co-operation and collaboration, and co-learning. In particular the nature of discussion around the task was valued throughout. This led to development of negotiating skills and group decision-making as well as respect for peers.

Teacher evaluators were asked to describe the curriculum relevance of the games that they were using. Teachers at different Key Stages identified specific curriculum objectives that games play could support.

At Foundation level the following were identified as areas where the use of a task based game may contribute to the achievement of Early Learning Goals, and have relevance to key skills at Key Stage 1.

#### Personal and Social Development

- I. Provide interest and motivation to learn.
- II. Maintain attention and concentration levels.
- III. Can work as part of a group and can learn to share resources.

### Language and literacy

- I. Encourage children to explain what is happening.
- II. Sustain attentive listening, responding to what they have heard by relevant comments, questions or actions.
- III. Use talk to organise, sequence and clarify thinking, ideas, feelings and events.

### Mathematical development

- I. Use everyday words to describe position.

### Creative development

- I. Recognise and explore how sounds can be changed, sing simple songs from memory, recognise repeated sounds and sound patterns and match movements to music.
- II. Respond in a variety of ways to what they see, hear, smell, touch and feel.
- III. Use their imagination in art and design, music, dance, imaginative and role play and stories.

### Knowledge and Understanding of the World

- I. Use early control software to investigate direction and control.

### Physical Development

- I. Fine motor control can be developed with the increased refinement in using a mouse for navigation and selecting objects.

At Key Stage 2 teachers specifically focussed on communication skills and on the skills of planning and strategy as well as some value in estimating and budgeting. In the games evaluated at this Key Stage it was difficult to identify specific targets within the curriculum that the games directly served. However there was evidence from a number of evaluators that the games were seen as a valuable tool for skill development and collaborative working.

“ The main advantage, in educational terms, of this software is the problem solving and co-operative skills that it demands if used in a paired/ group situation. I observed a number of strong, useful discussions between groups of

children, in which individuals were required to listen to others and to justify their ideas in ways that would encourage others to accept them. Although such discussions are encouraged in all subject areas, it seemed to me that the pupils felt the discussions generated by their use of this software to be of greater importance. Their desire to build an effective theme park sharpened their skills of debate and communication. Another advantage to these particular discussions was that pupils could see, sometimes immediately, the results of their decisions. This enabled any disagreements to be quickly dropped and for the work to carry on. For certain pupils who usually find discussions stressful and unpleasant when their ideas are not accepted, this was certainly a benefit.

*KS 2 Evaluator*

“ The financial burden on the park designer is well emphasized in the game – and the children were learning about budgeting, pricing, saving continuously. Decisions were regularly made with regards to purchases. Eg. ‘Should we buy the really expensive roller coaster or 5 or 6 other small rides?’ The real life skills the children apply when playing the game really are strengths of the program.

*KS2 Evaluator*

Skills identified within the playing of a business simulation at Key Stage 3 and 4 included:-

**Communication:** communication within the game is important and the setting up of scenarios/the hiring and firing of staff/playing the markets – all generate discussion and debate amongst pupils.

**Application of number:** budgeting is a critical part of the game; quite clearly it lends itself to the delivery of application of number.

**Working with others:** as for communication.

**Problem solving:** this lies at the heart of the game as pupils make the appropriate decisions that will keep them in the game.

**Financial capability:** as with application of number a sound understanding of numeracy is critical to success in the game.



## Integrating games use into the classroom

It needs confidence with the genre and imagination to integrate games into learning tasks eg data handling and reading within Championship Manager, creative writing from Freddi Fish. It also requires a knowledge of the game which the teachers in this evaluation had taken time to develop. In terms of practical lesson planning this takes too much time to develop as it can only be done through playing the game. The more complex games are, the greater the need for more teacher preparation.

Teachers need to both recognise and map the relationships between activities in the games and the associated learning before they can embed the use of the game within the wider learning context. They will almost certainly have to frame tasks either within the game or leading up to or following on from a session, or possibly all three. They will also have to cross-refer work on games with other work if they are to ensure transfer of skills from the games to wider contexts.

The greatest obstacle to integrating games use into the curriculum is the mismatch between the skills and knowledge developed in games, and those recognised explicitly within the school system. Throughout the teacher evaluation reports there are comments following an often long list of highly desirable skill sets developed through playing the game, to the effect that there is no time for these games in school as they do not match curriculum requirements. It seems that the final obstacle to games use in schools is a mis-match between games content and curriculum content, and the lack of opportunity to gain recognition for skill development. This problem is present in primary schools, but significantly more acute in secondary.

## Parents' views on software usage



### Methodology

Each teacher evaluator was asked to identify two children from their class or group who would be prepared to use the computer game at home, and who would also carry out a short evaluation of the game and answer other questions about game use at home. The game was sent home with the children towards the end of the summer term, and children and often parents and siblings played with them and completed the evaluation form which they sent back to TEEM independently. There was no attempt to tie the home use into the use that the children might have already made of the game in the classroom, and only a small number of parents commented on the relationship between what the child had already experienced and the use of the game at home.

### Features of the game which contribute to use

Within a home context, there are often other players to be considered in addition to the child for whom the game was provided. None of the games involved individual logging-on procedures for each player, but some did support file saving, and this did not present problems within the home context. Parents reported that children were keen to save the games and were frustrated in the cases where the software did not offer them this facility.

Almost all the parents of children at Key Stages 1 and 2 made some reference to the way in which the children engaged with others at the computer. In almost every context it was reported positively. Children 'could be left to play with little supervision,' and 'One child would control the game while the other tried to influence.' Another mother reported that 'When they finished playing they would talk among themselves about how good the game was, and how they would attempt it next time.' The comments also indicate the degree to which the parents value the conversation and discussion elements of the process.

“ My youngest son (9) enjoyed playing the game and spoke about what he was doing just about all the time he wasn't playing it. By the second day his elder brother (14) joined in and they took it in turns 1 hour each alternating although they would put their heads together to sort out a difficult situation. When they aren't playing they discuss what they have done and what they are going to do.

The Sims

Evidence from questions in which parents were asked about purchasing games suggested that in at least 50% of the cases, children had a significant input on the games purchased and that in terms of the 'family decision' parents were a knowledgeable voice.

Over 50% of parents of children of this age group commented on the importance of the discussion process that the children engaged in. Parents commented that some of the modelling games were 'Challenging and enjoyable, and stimulated more talking than usual with games. The children spent time away from the computer, planning.' Another commented that 'Everyone took turns, and gave ideas. They talked away from the computer about what they found difficult.'

Whilst most of these games were designed for single player use, pairs of children worked well together on them provided they were at similar levels of skill. Sometimes having a friend at a higher skill level was seen as really helpful as it helped the child over their difficulties. 'Help from a friend supported and extended interest.'

“ Son and friend (both 13) played for a couple of hours and seemed to really enjoy setting up the cars and choosing drivers and selecting car tracks. My son found controlling the car during a race quite difficult but it was clear that the more he played the better he got. Both took turns and whilst one was racing the other watch keenly and was offering tips and instructions.

F1 Racing Championship

Those modelling games which had two distinct phases, building followed by playing, either succeeded very completely with the children (or family) or one element or the other was enjoyed. Many families spent

very considerable time together playing games like these – in excess of 30 hours in some cases, and the complexity of the task contributed to the potential for this sustained level of engagement from a range of family members.

Games which consisted of a series of adventures or challenges sometimes in levels or through an environment attracted children's attention until they had completed them. The satisfaction of completion was generally sufficient to mean that the game was not likely to be played with subsequently. In some cases the number of levels or additional elements of interest maintained the children's attention for additional activity, but for older Key Stage 2 children this became less the norm. The completion of the challenge marked the end of the child's interest.

In the case of pupils at Key Stages 3 and 4, it was sometimes the case that they played with the game entirely alone. In some cases these students failed to engage with the game, and where that was so the parent reported that the child, 'Got bored with it. Played alone and did not talk to others about it.' This comment was applied to a title that was very successful for other pupils, illustrating that the success of games is likely to be as variable as other media in engaging children's interest.

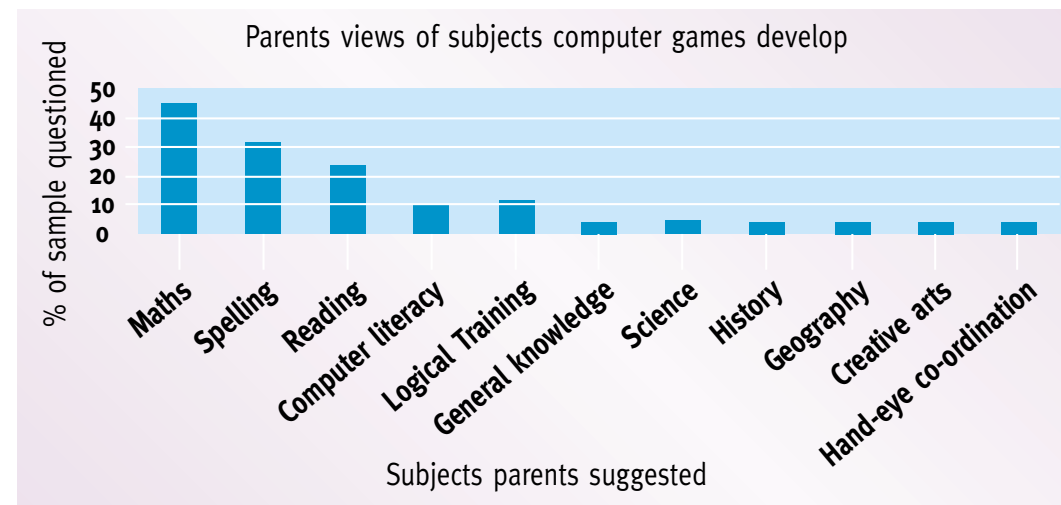
### Learning outcomes valued by parents

85% of the parents evaluating games with their children believed that computer games contributed to learning as well as providing entertainment. Many acknowledged that the balance shifted with age, so that whilst games can be bought for younger children that directly contribute to the child's spelling and maths skills, older children are more likely to value games directly for their entertainment value.

“ My son (5) played this game with myself and a few friends, mixed ages and sexes. The boys especially enjoyed this game which was excellent in all respects. There was plenty to hold their attention and get results from, for all abilities, with fun and interesting results. The children's attention was held for long periods of time and they worked well taking turns to play and the conversation and interest was lively. An excellent program. The girls enjoyed the program but there could have been more to interest them. Bob the Builder does appeal more to boys especially in role play.

Bob the Builder

Parents' views of the subject knowledge that computer games might support provided the following results. Almost half of parents questioned believe that computer games have helped with maths in some way, a third that computer games contribute to spelling and almost a quarter that reading is enhanced by the use of the computer. 10% of parents see computer literacy as knowledge learnt and 12% of parents identified logical thinking as a valued outcome. Science, history and geography were mentioned by at least 2 parents in each case, as were hand-eye coordination, creative art skills, and general knowledge.



It is clear from this list that whilst these parents have a traditional view of the materials learnt in school, they also recognise that there are additional areas of knowledge that children need to acquire, and that some of these are directly related to the computer, and others are not. In this context, they too value higher order skills that are often not formally taught within the curriculum.

There was some overlap between what they considered knowledge and skills, and some of the above items appeared in both places in their questionnaire response. They were asked which skills children were developing as they used computer games, and were offered strategic thinking, decision-making, designing and cooperation. These were prioritised by parents as decision making (40%), design (25%), strategy and cooperation (20% each). Problem-solving also registered 20%, concentration, mouse control and taking turns 10% each, and hand-eye coordination, perseverance, coordination, listening, observation, and prioritising all receiving more than one mention. It is clear that parents strongly value these skills and refer to them in their evaluations of the children's game playing activities.

## Integrating games use into family life

Whilst 60% of the parents reported that their children played alone with the game at some time during the evaluation, only two children had had no one playing the game with them at any time. In 95% of the evaluating families other family members had got involved; siblings were the most common other family member, but parents were significantly represented, with 40% fathers and 22% mothers getting involved. About 40% reported that the children always played with friends, usually their own peer group, but occasionally a mixture of ages playing along. These trends were also reflected in the larger sample of questionnaires from children (see p16).

There is clear evidence that parents are actively involved in the choice of games, especially for the youngest players, and in 40% of families with Key Stage 3 children they reported that decisions on software purchase were made by the family, or in discussion with the children. The picture that emerges of computer use, is one in which the computer is often shared among family members and is located centrally in the house – the kitchen, or living room was specifically mentioned in 10% of the questionnaires. In part this might arise out of the Internet access that the computer often offers. 80% of the parents in this survey reported that Internet access is monitored by them.

60% of the families had games consoles in addition to the computer (which was necessary in order to take part in this evaluation). No conclusions can be drawn about usage of these machines within the home from the information we have available, though it is clear from a significant number of the responses that different games, often joystick driven, have been bought for the different platforms. This is borne out by evidence from pupil questionnaires in the following section.

## Analysis of pupil questionnaires



### Overview

The stereotypical picture of the lone boy playing aggressive computer games alone in his room is not fully representative of young people's use of computer games. In fact both boys and girls enjoy computer games, and even though they play in their rooms they often play with a friend or family member. As a result they describe that working as a team, decision making and planning are commonly reported learning outcomes from games playing.

The games which pupils prefer and which keep their attention are those which offer an appropriate level of challenge, and multiple levels so that they can make progress. Generally, although arcade style games are common, adventure and race games are also very popular.

Computer games are a more embedded part of boys' leisure culture than that of girls. Boys are more likely to read computer games magazines and use them to inform their purchase of games; also they favour games that are associated with their other interests especially sports. Boys view game playing as a first choice activity, whereas girls are more likely to play when they are bored or have nothing better to do.

Internet access is almost universal among the group questioned, with less than 5% having no access at all. Game playing over the Internet is a minority activity, but use of game related sites and 'cheats' is popular.

Pupils spend less time playing games in Key Stage 4 than 2, and this is most marked amongst girls. Although games are popular among girls, and they spend considerable time playing, boys tend to play more frequently and for longer. There is evidence from this group that approximately 25% of pupils, largely boys, play every day for more than 2 hours.

### What do they play?

The most popular games genres were Adventure, Race Games and Shooting/Arcade. At KS 2 and 3 Adventure was ahead of the other two, but in KS 4 it was equal first with Race games. Race games remain equally popular with girls and boys in all Key Stages, as do shooting/arcade games in Key Stage 2. However, girls are far more likely to favour adventure games than boys through out.

When asked to name their three favourite games pupils came up with a high variety but most were mentioned only once or twice. Some games did show very high incidence, these include:

#### The favourite games listed most commonly by each age group by gender

Key Stage 2 Girls	Tomb Raider and The Sims collection
Key Stage 2 Boys	Pokemon, James Bond Golden Eye, Tomb Raider, Driver, WWF Smackdown, FIFA
Key Stage 3 Girls	Tomb Raider, The Sims, Crash Bandicoot
Key Stage 3 Boys	James Bond Golden Eye, Tomb Raider, The Sims, Driver, Tony Hawkes' skateboarding, FIFA, WWF Smackdown
Key Stage 4 Girls	Tomb Raider, Mario Brothers, The Sims, Crash Bandicoot, Grand Turismo, Solitaire
Key Stage 4 Boys	Perfect Dark, Red Alert, Grand Turismo, Tony Hawkes' skateboarding, FIFA, Championship manager, WWF Smackdown

At all key stages boys identified a wider range of games than girls, and for both genders the range increased with age. Some games clearly have an appeal across the age range. Boys favour games which relate to sports they follow, girls are very unlikely to mention such games.

When asked to identify the features of their favourite games that they like best, pupils named a wide range of features covering presentation, structure, the nature of the activity or some kind of personal response. Graphics, colour, use of characters, gameplay, fun and challenge were all mentioned frequently by all age groups, independently of gender. The only clear difference by gender was that the boys at all ages make more frequent reference to some form of fighting/violence/ shooting. Some girls also like fighting in games – as many as 11% mentioned this in Key Stage 2.

Overall pupils were more likely to play games on a games console rather than a PC, but most played on more than one platform and PC use only dropped below 50% for KS 3 boys. Girls reported more PC use and less game console use than boys except in KS 4 where slightly more girls than boys reported Gameboy use, although other games consoles were still more popular with the boys.

### Where and when do they play?

The majority of pupils play games at home, most frequently in their rooms. Key stage 2 pupils are more likely to play elsewhere in the house than older pupils. No more than 15% (KS 3 Girls) report playing at a friend's house. Very few report playing games at school, with the only significant incidence at KS 2 where 12% of girls report playing.

Not surprisingly games are played at weekends and after school. There is a tendency among girls to play games when they are bored or have nothing more interesting to do, whereas boys are more likely to play games as a first choice activity.

### How long do they play?

Approximately 25% of pupils reported playing games for over 2 hours at a time in each keystone. This group was composed of at least twice as many boys as girls, except in KS 3. By KS 4 80% of girls reported playing up to 1 hour or less, whereas 57% of boys were still playing up to 2 hours or more. Other than these trends, the pupils reported fairly evenly across the options.

Over 30% of KS 2 and 3 pupils report playing every day, which drops to 24% in KS 4. Again boys are approximately twice as likely as girls to report daily game playing. Girls most commonly reported playing 2-3 times a week, and by KS 4 80% were playing either 2-3 times a week or less. Boys too play far less in KS 4 than in KS 2 or 3, with 60% of all pupils reporting 2-3 times a week or less. Overall the patterns for times per week matched those for length of session suggesting that there is a range of engagement with an underlying trend which sees less game playing with age, especially by girls.

### % responses to the question: How long do you play games at a time?

(Circle only one)

Options	KS2 Girls	KS2 Boys	All KS2	KS3 Girls	KS3 Boys	All KS3	KS4 Girls	KS4 Boys	All KS4
Up to 30 Minutes	26.2	8.5	17.8	22.2	13.7	18.3	40.9	11.9	25.8
Up to 1 hour	31.0	26.9	29.1	43.6	28.4	36.5	40.9	30.7	35.6
Up to 2 hours	26.9	25.4	26.2	12.0	23.5	17.4	6.5	21.8	14.4
More than 2 hours	15.9	39.2	26.9	22.2	34.3	27.9	11.8	35.62	24.2

### % responses to the question: How many times a week do you play computer games? (Circle only one)

Options	KS2 Girls	KS2 Boys	All KS2	KS3 Girls	KS3 Boys	All KS3	KS4 Girls	KS4 Boys	All KS4
Once a week	23.4	6.2	15.3	13.7	6.9	10.5	40.9	11.9	25.8
2-3 times per week	43.4	23.1	33.8	43.6	28.4	36.5	40.9	30.7	35.6
4-6 times per week	19.3	21.5	20.4	15.4	16.7	16.0	6.5	21.8	14.4
Every day	13.8	49.2	30.5	27.4	48.0	37.0	11.8	35.6	24.2

## Who do they play with?

Overall pupils are more likely to play games with one or more friends than on their own. They also play with family members, although even girls are more likely to play with a male family member than a female one.

**% response to the question: Do you play games with other members of your family? (Circle all that apply)**

Options	KS2 Girls	KS2 Boys	All KS2	KS3 Girls	KS3 Boys	All KS3	KS4 Girls	KS4 Boys	All KS4
Mum	20.0	13.8	17.1	29.9	15.7	23.3	21.5	7.9	14.4
Dad	25.5	31.5	28.4	34.2	37.3	35.6	16.1	39.6	28.4
Older Brother	29.7	28.5	29.1	36.8	27.5	32.4	18.3	25.7	22.2
Younger Brother	34.5	29.2	32.0	28.2	25.5	27.9	29.0	42.6	36.1
Older Sister	20.7	9.2	15.3	20.5	15.7	18.3	15.1	2.0	8.2
Younger Sister	26.9	17.7	22.5	21.4	14.7	18.3	16.1	19.8	18.0
Other	12.4	11.5	12.0	18.8	13.7	16.4	4.3	11.9	8.2

## What do they own and who pays for them?

Pupils are more likely to own either less than 10 or over twenty games, and boys are more likely to be in the second group. Younger children own more games than older ones. This may be because the games they report in their favourites list are smaller, cheaper products. Parents are far more likely to have bought games for KS 2 and 3 pupils, with over 75% reporting parents as paying for games. However, children spend their own money as well as receiving presents. KS 4 pupils are as likely to buy games with their own money as have parents buy them, although boys are more willing to do this than girls.

In KS 2 and 4, pupils are equally split on the influence of parents on purchases. However, in KS 3 over 75% of both boys and girls report that their parents influence what is bought. Generally parents tend to restrict access to games which are too violent or frightening, or too expensive.

Many pupils report having bought games which they did not play as much as they expected. The most common reason for this was that the

game did not prove as challenging as they expected, so that they completed it easily and lost interest. Once an adventure game has been completed, few children return to it again.

Boys are more likely to read reviews to decide what games to buy, whereas girls are more likely to be guided by personal recommendation. The information given on the pack is very important with up to 40% of both boys and girls giving this as the source of information that they use to decide what to buy.

## What do they learn?

Working as a team is the most commonly reported skill developed through game playing in KS 2 and 3. At KS 2 boys and girls report this more or less equally at 48%. At KS 3 the overall figure is 64% but only 55% of girls as opposed to 75% of boys selected this option. At KS 4 the most commonly reported skill is decision making, but planning and working as a team are also popular. Girls report more decision making and boys report more planning and working as a team.

At Key Stage 2 19% boys and 31% girls believe that game playing helps with school subjects and general knowledge. There are also reports related to ICT skills and spelling and reading. No specific school based learning is reported by secondary school pupils. This probably reflects the content of the games that are played at the different key stages, which does vary even though the favourite games at each key stage does not vary very much.

## Internet access

Home Internet access is lower than school access at KS 2 and 3, but marginally higher at KS4. The lowest incidence of home access is among KS 3 boys, at 48% (69% of KS 3 boys have home access) and the highest among KS 4 boys at 78% although KS 4 girls report 77%. School access is highest at KS 2 with 90% and lowest at KS 4 with 73%. Access other than at home and school is significant, rising to 25% in KS 4. In all categories well under 5% of pupils report no access to the Internet.

**% responses to the question: Do you have Internet access:**

(Circle all that apply)

Options	KS2 Girls	KS2 Boys	All KS2	KS3 Girls	KS3 Boys	All KS3	KS4 Girls	KS4 Boys	All KS4
At home	66.9	71.5	69.1	69.2	48.0	59.4	77.4	78.2	77.8
At school	91.7	88.5	90.2	77.8	69.6	74.0	76.3	70.3	73.2
Other	9.0	11.5	10.2	5.1	10.8	7.8	12.9	12.9	24.8
No	1.4	0.8	1.1	2.6	2.9	2.7	0.0	3.0	1.6

Parental permission to access the Internet is required by about 50% of pupils in KS 2 and 4, with no clear gender difference. However at KS 3 girls are three times more likely to require permission, and boys twice as likely as not. Together with the influence on games purchase it seems that parents have a greater perceived role in KS 3.

About 50% of pupils play games through the Internet. There are small variations but no clear trends by age or gender.

**Games at school**

When pupils were asked where they played games, schools did not feature very frequently at all. However when asked directly if they played games at school the answers were more positive. This probably reflects the fact that pupils do play games at school, but nowhere as frequently as at home. Girls are slightly less likely than boys to play games at school, and games playing at school reaches a peak on KS 3 with 70% of pupils reporting positively. However this drops significantly to 23% in KS4.

**% responses to the question: Do you play computer games at school?**

Options	KS2 Girls	KS2 Boys	All KS2	KS3 Girls	KS3 Boys	All KS3	KS4 Girls	KS4 Boys	All KS4
YES	40.7	51.5	63.4	69.2	72.5	70.8	21.5	24.8	23.2
NO	59.3	48.5	54.2	30.8	27.5	29.2	78.5	75.2	76.8

**Implications for successful computer game design for classroom use**



**Design and navigation issues**

As has been shown throughout this report, there are some valuable opportunities that some genres of game could offer to support learning outcomes within a formal educational setting. These opportunities could be greatly enhanced if some of the following program design issues were taken into consideration. Not all of these issues will necessarily apply to any one game, but addressing them where appropriate could significantly facilitate the use of games within an educational context.

**Providing pre-set scenarios**

Some of the games that combine a model building phase with simulations could offer pre-set scenarios that children could explore. These support the learning of the basic elements of game play without a long lead in for setting up the initial scenario. The pre-set scenarios might be used directly in the curriculum where they provide simulations which illustrate concepts relating to geographical, historical or business topics that are included within the curriculum. The learning that is traditionally part of the curriculum is then supported by running the simulation from a particular starting point and discussing the outcomes. Running these might illustrate concepts associated with sustainable development, running a successful business, or specific historical situations. Teachers could manage the use of these programs in the classroom if they could direct pupils to an existing scenario as a starting point for a learning activity, which might then develop into a task which built on, or started a new scenario.

In addition, if these scenarios could be edited by teachers, then these could be linked to specific teaching points that the teacher wanted to make. This would lower the threshold for teacher preparation that building scenarios from scratch presents in many cases, both in terms of level of expertise with the application, and the time taken.

### Accuracy of content

Where simulations are included, they need to be consistent with reality if they are to be useful in a school context. Relying on magic spells as a way out of a dangerous situation is not appropriate in a factual learning context. There also needs to be an appropriate level of educational accuracy – this might apply to historical titles, but also to simulations used where physical forces are represented – race track titles, flight simulators and so on. Where the rules of the natural world have been used to construct the algorithms that determine the actions in a game, it would be helpful to make this clear so that teachers can be confident in their use of the software in teaching.

Titles also need to take account of the fact that issues of race, gender, age, disability etc need to be handled appropriately within the title.

### Saving and restarting

Saving is a very significant factor if games are to be used in the classroom. It is important that the game can be saved when the lesson finishes and also critical that that position can be the starting point in a future session. The restriction on time makes it particularly important that the pupil can get back to their finishing point very quickly at the beginning of the next lesson.

It is also important that saving facilitates saving more than one person's name – children often work in pairs, and need to be able to restart the game perhaps with a different partner next time. Moreover, it must be possible to save a whole class of separate re-starting points as pupils often take turns in playing a game on the same system.

### Information to the teacher

If the title is to be successfully used within the classroom, then the teacher will need appropriate information to enable them to integrate the game within their lesson planning. This should include a brief synopsis of the content and format including any rules or models used to drive simulation elements. In addition, it would help teachers to receive information about games playing ideas for the classroom, and guidance on the way in which the content might be used. Without this, games will continue to be only used by teachers who are themselves games players. However, games developers targeting the leisure market may not be best placed to provide this guidance.

### Role of sound

In the primary classroom, games are often used as an activity at the back of the class designed to support other curriculum tasks. Often two children

work together on a game. It is valuable for them to be able to talk together about the task they are carrying out. Those games that have a high level of background music or noise are difficult to use in this situation, and using headphones makes it easier on the rest of the class, but makes it difficult to have discussion or conversation between the players. It is valuable to have controls so that the background sound can be turned down or off for use in this context.

### Elements of games that make their play successful

Whilst direct comparisons were not made with the variety of educational games that are available in the school context already, a number of comments did emerge through which pupils engaged in this project compared these games with those that they normally access in school, and commented on the way educational titles could be enhanced.

One of the biggest differences that pupils commented on was the way in which the challenges presented in these games relied on inference and much less direct questioning than their educational counterparts. Solving the problem often depended on the balance between a number of factors which might be timing, position and choice of response, but it might also be about laying out elements of an environment and deciding when to build a new roller coaster, or a new building, or attack a neighbouring village. This sort of problem solving meant that it was often desirable to have another person playing the game to discuss strategy with, and this conversation was enjoyable to both players. The value of two people playing some of the games devised for use within the classroom is often unclear, and the experience in primary school in particular often leads to the computer use being one of taking turns rather than sharing the task. Yet pupils, teachers and parents all recognised that the collaborative problem solving that such games require is a major element in the educational value of these games. It also proved a key cause of the sustained engagement that is widely reported to be a feature of computer game playing that is so sought after in the classroom.

Games were enjoyed where timing was not dictated by the computer, and pupils commented on enjoying the choices for action the games presented.

“ This can take as much or as little time as you want, all depending on when you attack the opposition. The longer you take, the stronger your army will be, but the more likely the other empires are to attack you.

KS 4 pupil



Some pupils also commented on the fact that knowledge gained outside the game environment might be valued in the games involved in this project, but less so in those designed for the classroom. One car rally game allowed the player to choose their tyre traction in setting up the car. Pupils commented that it was helpful to know that you would need a tyre with more traction to drive on dirt. The inclusion of this ‘practical’ knowledge was seen as unusual within available educational games.

Many of the pupils commented on the importance of the challenge that the game offered – immediate success was not important. Many of the parents and pupils playing at home commented on the importance of leaving the game to think about strategy and what process to try next time. Within the educational context, many of the game elements are concerned to ensure that the tasks are small enough to give success when pupils leave their turn at the game. Perhaps extending the challenge to ensure that further thinking and problem solving takes place would be a valuable extension of the activity and immediate success is not as important as some developers think.

“ To play the game well you need to be able to imagine what is going to happen before it happens. When you make a mistake it helps you to plan what to do better next time.

KS 4 pupil

## Curriculum issues

### Valuing thinking skills in the curriculum

There were many comments from teachers, parents and pupils about the valuable ways in which games made them think. However, within the school curriculum teachers found it hard to justify using resources whose value lay in thinking alone, however effective that resource might be at developing thinking skills.

### Stimulating communication skills in school

Many of the games evaluated were designed to be played by two players discussing the scenario and planning what to do. This discussion was often very much valued by the teachers involved, but again teachers felt that the game as stimulus would be hard to justify including within the curriculum as it is currently framed.

## Games evaluated in project



Publisher	Software	Key Stage	Type of game
BBC Multimedia	Tweenies	1	Edutainment
Infogrames	Bob the Builder	1	Edutainment
Infogrames	Putt-Putt Enters the Race	1	Adventure game
Infogrames	Pajama Sam	1,2	Adventure game
Infogrames	Freddi Fish	1,2	Adventure game
Infogrames	Rollercoaster Tycoon	2,3	Model/simulation
Videosystem Entertainment Ltd	Formula One Racing	2, 3, 4	Race
Lego Media Interactive Ltd	Legoland Lego Alpha Team	2 2	Simulation Maze game
Matel Interactive	MicroRacers Uno	2 2	Race around the track Simulation
Microprose	Worms United	2	Edutainment
Microsoft Ltd	Age of Empires	2,3	Simulation
Monte Cristo Multimedia SARL	City Traders	4	Model / simulation
Eidos Interactive Ltd	Championship Manager	2,3	Simulation
Electronic Arts Ltd	The Sims Sim City 3000	3,4	Simulation
Blue Byte Software	The Settlers (IV)	2,3	Adventure game

## TEEM Games evaluation schools



### Primary

#### School A

LEA: Wiltshire Type: Church of England Voluntary Controlled

School A caters for children in KS1 and KS2. All children are aged between 4 and 11. There are currently 80 children attending the school, split into three classes which are subdivided for certain areas of the curriculum. It is a village school drawing its intake from its own and surrounding villages.

(OFSTED Report dated 06/99)

#### School B

LEA: West Sussex Type: Middle Deemed Primary School

School B caters for children in KS2 and KS3. All children are aged between 8 and 12. There are currently 482 children attending the school, split into 16 classes. The school is a large, urban middle school and although the intake comes mainly from three local first schools, it has a much wider catchment area. Pupils are mainly from traditional, stable homes although an increasing number are coming from divorced or separated parents. Less than 2% come from an ethnic background.

(OFSTED Report dated 07/97)

#### School C

LEA: Kirklees Type: Primary Community School

School C caters for children in KS1 and KS2. Children are aged between 4 and 11. There are 216 pupils currently enrolled at the school. School C is one mile outside a town. 95% of pupils come from a minority ethnic background and for two thirds of the children, Punjabi is their first

language. The percentage of children requiring Special Needs teaching is high, as is the number of children requiring free school meals. Social and personal skills are also below average.

(OFSTED Report dated 01/00)

#### School D

LEA: Northumberland Type: First

School D caters for KS1 and KS2, with pupils aged between 3 and 9. There are currently 242 pupils enrolled at the school. School D is in a small coastal town in the south-east corner of Northumberland. There is high unemployment and associated social problems. The catchment area extends further than the immediate locality and 46% of pupils actually live outside the catchment area. Many pupils live in rented accommodation. Almost all pupils are from white ethnic backgrounds. Those children eligible for free school meals is above the National Average. 25.6% have Special Educational Needs.

(OFSTED Report dated 07/98)

#### School E

LEA: Wiltshire Type: Primary

School E covers KS1 and KS2, with children aged between 4 and 11. There are currently 34 pupils enrolled at the school, but the numbers are dropping. School E is in a small village and almost all the pupils come from the village. The school is smaller than most other primary schools. Pupils come from a variety of backgrounds, but for the majority, their socio-economic circumstances are above average. Those children eligible for free school meals is average and those requiring Special Educational Needs is above average.

(OFSTED Report dated 10/99)

#### School F

LEA: Norfolk Type: Middle Deemed Voluntary

School F is in a western suburb of a city and covers KS2 and KS3, with pupils aged between 8 and 12. There are currently 280 pupils enrolled at the school, of which 7.1% come from non-white ethnic backgrounds. English is the second language for 3.2% of the children. 42.5% of pupils have Special Education Needs, much higher than the National Average.

5.4% of pupils have statements of Special Education Needs which is three times the national average. 35% of pupils are eligible for free school meals.

(OFSTED Report dated 05/00)

### School G

LEA: Staffordshire Type: Infant & Junior

School G is in the village of outside a large town. It covers KS1 and KS2, with pupils aged between 4 and 11. There are currently 176 pupils enrolled at the school. Most pupils come from the village, but approximately 4% travel by bus from surrounding villages. Pupils come from a wide range of backgrounds, with a mixture of both council and private housing. 7% of children are eligible for free school meals. This is below average and falling. 14.5% of children have Special Educational Needs and 2.3% have a Statement of Special Educational Needs which is above the National Average. At the time of the OFSTED Report, there was only one child at the school from an ethnic minority.

(OFSTED Report 09/99)

### School H

LEA: Cambridgeshire Type: Infant & Junior

School H is a large village six miles north of a rural town and covers KS1 and KS2, with pupils aged between 4 and 11. There are currently 488 pupils enrolled at the school, with the majority coming from the village itself. Although 5% of pupils are eligible for free school meals and unemployment in the area is low, a number of pupils come from low income families and from a wide range of backgrounds. Nearly all pupils are from a white ethnic background, with only 1.2% of the school coming from a non-white ethnic background. At the time of the OFSTED Report four pupils used English as an additional language. 20.9% of pupils have Special Educational Needs, with 2.7% having Statements of Special Educational Needs.

(OFSTED Report dated 03/00)

## Secondary

### School I

LEA: East Sussex Type: Maintained Comprehensive

School I caters for children in KS3, KS4 and Further Education. Children are aged between 11 and 18. There are 1374 pupils currently enrolled at the school – 118 in the Sixth Form. Pupils come from a mainly urban area. The catchment area has a below average percentage of high social class households and adults with higher education qualifications. The proportion of pupils claiming free school meals is high for a school in a Shire County. Special Education Needs is average and only a small number of pupils do not use English as their first language.

(OFSTED Report dated 05/96)

### School J

LEA: Wiltshire Type: Comprehensive

School J covers KS3 and KS4, with children being aged between 11 and 16. There are 413 pupils currently attending the school which makes it much smaller than other secondary schools. School J is in a small town and the majority of pupils come from there. Pupils come from a variety of backgrounds and overall their backgrounds are relatively advantaged. Those children eligible for free school meals is below the National Average and pupils from ethnic minorities make up less than 1% of pupils. Those pupils requiring Special Educational Needs is around the National Average.

(OFSTED Report dated 05/99)

### School K

LEA: Cambridgeshire Type: Comprehensive

School K is a Technology College and also a Village College, with a strong commitment to Community Education. It covers KS3 and KS4, with pupils ages ranging from 11 to 16. There are currently 1087 pupils enrolled at the school. The school has a semi-rural catchment area and is located south of a rural town. It is an area of relative social and educational advantage. Those children qualifying for free school meals is below average and the number of pupils from an ethnic minority is low. Those pupils for whom English is a second language is slightly higher than the national average, but no pupils are in the early stages of learning English.

(OFTSED Report dated 11/00)

## School L

LEA: City of Bristol Type: Comprehensive

School L covers KS3, KS4 and Further Education, with pupils aged between 11 and 19. There are currently 1129 pupils enrolled at the school. The School is close to the centre of a city and few pupils come from the immediate area. Some travel large distances to school. 10% of the pupils are from ethnic minorities, with only a small proportion coming from homes where English is not the first language. 8.2% qualify for free school meal which is below the National Average. 15.1% require Special Needs Education. 90% of pupils stay on for Further Education.

(OFSTED Report dated 01/98)

## TEEM teacher evaluation framework



In constructing the evaluation framework TEEM has produced a single document that will relate to a wide range of different games. The framework includes a range of questions and issues under the headings known to be significant when evaluating software. Some of the questions may be redundant when it comes to writing about particular games. However, whatever the software, the purpose of the framework is the same. It is a document that presents a number of headings under which teachers report on their findings and experience of a program, and offers prompting questions that have to be considered when writing about each of the particular issues – content, curriculum relevance, design and navigation and so on. In writing to the framework, teachers will have developed a sensitivity to the issues relevant to each section as they view each game, and then write about the title with those issues in mind. This ensures that there is a commonality of information about the evaluated games, allowing appropriate comparison of evaluations.

# TEEM teacher evaluation framework

**TEEM ID ref:** Comes on a sticker on the software box

**Title:** As given on the software

**Key Stage:** For which you are evaluating the software

**Subject(s):** In which this game might be useful

**Topic(s):** Within a subject for which this game might be useful

**Special needs categories:** For which this game might be useful

**Machine used** (Processor type, RAM size, speed of CD-ROM, setting of monitor, specification of on-line link if appropriate)

**Name of author:** Your name

**School:** Name and Town

**Age of pupils** (School year, average age)

*Please remember that points 1 – 6 should be answered in full sentences*

## 1. Overview of the use of this game in the classroom

*Give a brief summary of the game and how it might be used in a classroom.*

Questions to consider:

- Which subject areas and which teaching and learning objectives does this game support?
- What are the strong features of this product for classroom use?
- Where is this product best suited within the school context?
- What would teachers need to know in order to use this product effectively?
- What are the weaknesses of the product for classroom use?
- What style of computer usage would this product support ie whole class in computer room, small group on one machine in classroom etc, individual use, pairs, groups etc?

## 2. Curriculum relevance

Games software may merit a place in the classroom because they help children to develop educationally relevant skills, and/or they address curriculum relevant content. Before completing this section, you will need to decide which if any of these the current game might serve.

### a) content

- Is the relevant content sufficiently defined for classroom use? For example is the relevant content easy to distinguish from other content in the game which children are not required to learn?
- Is there enough relevant content to justify the use of the game?
- Is the arrangement of the content sufficiently accessible to justify use?
- Is the quality of the content acceptable? Consider accuracy, currency, bias and relevance as well as quality of images, video, and sound where these occur.
- Where the game simulates a real world environment, do the laws governing actions and consequences, and the behaviour of individual elements, follow accepted models or rules related to the same real world situation? For example, does a simulated city behave economically according to a recognised economic model, and if so, which model?
- Do the skills practised in the virtual environment match those that would be required in the physical world? For example, does accelerating out of the bend improve road-holding in a motoring simulation?

### b) skills

As well as subject related skills, many games demand that the user employs strategic, or sequential thinking, problem solving and complex thinking skills to solve the puzzles or play the game. These may include generating hypotheses and testing them. Comment on the sort of thinking strategies and skills that you see that children have to follow to use the game. Some of these terms from the Key Skills syllabus may be useful.

**Communication** – participating in group discussions; understanding and responding to others.

**Application of number** – calculation skills, applying calculation skills and understanding of number to real life situations.

**Working with others** – to meet a challenge, develop social skills, and enquiry and decision making skills.

**Improving own learning and performance** – identifying ways to improve own learning and performance, identifying obstacles and problems, discussing ways to improve learning.

**Problem solving** – identifying and understanding a problem, planning solutions, monitoring progress, reviewing solutions to a problem.

**Financial capability** – budgeting, spending, saving, sharing, borrowing and obtaining value for money.

**Enterprise education** – risk management, learning from mistakes and being innovative.

### 3. Design and navigation

*Do the design and navigation of the program support use in the classroom rather than get in the way?*

The following may help you consider the above question:

- Are the icons meaningful and can they be easily selected by a mouse click?
- Can you get in and out to the section you want easily; can you bookmark where you've been, or record an individual users place so that they can restart where they left off?
- Is it clear how you move around the product?
- Is there a trail facility to navigate back through the program?
- Where there are tasks for the player, is a record kept of their score?

### 4. Ease of use

- Can a child use the software with minimal help, either alone or with a peer?
- Is there a significant amount of time which has to be spent setting up the game – building an environment, infrastructure before the 'game' can be played? Are there examples provided to start the user off?

### 5. Edutainment

Where exercises are offered on screen;

- Are these exercises easily and reliably accessed (or 'hidden' in the resource)?
- Do the exercises become progressively more difficult?
- Does the user know when the answer is right or wrong?

- Is feedback given to reinforce accurate answers?
- Does the program keep track of what the child has done, and the levels achieved?
- Can the teacher set levels of activity for a child to work on which the child can then access when they log on?
- Is there sufficient content so that children are not presented with the same question twice? Or are questions randomly presented?

### 6. Installation

- On first installation, did the software install OK?  
If not, say why and how you corrected this.
- Are there any known conflicts with other programs?
- Did it alter the machine configuration (and leave it that way after use!).
- Can you 'uninstall' the program? Do try this if the option is there.

NB In issues of speed try to quantify where things are deemed unsatisfactory – also make sure you are not using a machine below that specified for the game. Here speed relates to use – if everything is so slow the pupils have wandered off by the time anything happens that's a problem, if they are happy to wait for the results that's OK.

## Parent questionnaire



This questionnaire was used to collect evidence of use of games play in the home

In constructing this questionnaire, TEEM was conscious that it would be used by parents who reflected a wide range of interest in, and experience of, using software with their children. Its purpose was to concentrate on those factors that both described the way in which their children interacted with the given game, and also painted a picture of the wider use the family and friends made of software and computers.

### This questionnaire is to be completed by the parent/carer of the games player.

Name of parent/carer

.....

Role in family

.....

Age of your child

School Year

.....

Age of other children in your household

.....

School name

.....

Game title

.....

Details of computer used

.....

(Please give as much information as you can about your computer eg type, processor type, RAM size, speed of CD-ROM, setting of monitor, specification of on-line link if appropriate)

### 1. The Game and How Your Family Used it

Give a summary, in not more than 300 words, of the game itself and how it was used.

The following may be helpful in deciding what to highlight:

- Who in the family played the game?
- Did your child play alone or with a friend or sibling, or in a group?
- Did they play often over a period of time, or only once or twice (did the game sustain their interest?)
- Did your child carry over elements of the game into their other play, for example by pretending to be a character in a game, or including references to the game in their drawing?
- If a group played, did they play together, or take turns (some games only allow one player at a time), or did one operate the computer while others tried to tell them what to do!
- Did the children talk about the game when they were not playing it? Did they ever seem to be planning how they would play next time?

### 2. Frequency and Use

- a) How long did your child play with the game at a session? (Please circle)  
30 minutes at a time / 1 hour at a time / 2 hours at a time
- b) Did your child play alone or with friends? (Please circle)  
Alone / 1 - 2 friends / 3-4 friends / More than 4 friends
- c) Were the friends: (Please circle)  
Same age as your child / Younger / Older?
- d) Did other people in the family play the game? Who? (Circle all those that apply)  
Mother / Father / Younger brother / Older brother  
Younger sister / Older sister / Other .....

### 3. Enjoyment of the Game

- a) What did your child like about the game?
- .....
- .....

- b) What did your child dislike about the game?
- .....

c) Were these the same for other family members?

.....  
.....

d) Did your child want to go back and play the game again, or was there a limit to their interest? Give reasons for your answer.

.....  
.....

**4. Playing Other Games**

a) How many computer games does your family own? (Please circle)

1-10 / 10-15 / 16-20 / More than 20

b) What are they? Please try to be comprehensive and list as many as you can remember.

.....  
.....  
.....

c) Are they usually played on a games console or a computer? (Please circle)

PC / Nintendo / Game Boy / Sony Playstation / Other .....

d) Who chooses the games within the family?

.....

e) If you choose games, do you choose them because of their 'learning' value or as entertainment? (Please circle)

Learning Value / Entertainment / Both

f) Does this change as children get older - eg the younger children have games bought for them for learning, whilst the older ones choose the games themselves for the entertainment value?

g) Are there any type of games that you won't let your children buy? (Circle all that apply)

Adventure / Simulations / Race games / Sport / Maze games

Shooting/arcade games / Creative/model building

Traditional games eg chess/solitaire

Other .....

h) Which types of games does your child like best? (Circle all that apply)

Adventure / Simulations / Race games / Sport / Maze games

Shooting/arcade games / Creative/model building

Traditional games eg chess/solitaire / Other .....

i) Which games do the rest of the family like best? (Circle all that apply)

Adventure Simulations Race games Sport Maze games

Shooting/arcade games Creative/model building

Traditional games eg chess/solitaire

Other

**5. Playing Computer Games and Learning**

a) Do you think your children learn things when they play computer games? (Please circle)

Yes No

b) What sort of things do they learn?

Subject knowledge eg. how to do maths, or spell.

Please give details

.....  
.....

Skill development (eg. strategy negotiation, cooperation, decision-making, designing.

Please give details

.....  
.....

**6. Games on the Internet**

a) Do your children play games through the Internet? (Please circle)

Yes No

b) If yes, which games?

.....  
.....

c) Do the games they play have linked Internet sites or cheats? (Please circle)

Yes No



**d)** Do they use them? (Please circle)

Yes No

**e)** Does your child have to get permission from you to use the Internet?  
(Please circle)

Yes No

**f)** Do you limit your child's Internet access eg. by time, by only accessing it with you present, by using software that limits access?

Please give details

.....  
.....

#### **7. Other Comments**

If you would like to make any other comments about the game (eg. How easy it was to install or features that you liked/disliked) or this questionnaire please use the space below and continue overleaf if necessary.

.....  
.....  
.....

Thank you for taking the time to complete this questionnaire.  
Please return it in the reply-paid envelope by 20 August 2001 to:

Games Evaluation  
TEEM Ltd  
Shelford Studio,  
46 Whittlesford Road, Little Shelford,  
Cambridge  
CB2 5EW

Many thanks to the teachers, children and parents who worked on this games study. Also thanks to BESA who hosted the focus group meeting for teacher evaluators.

Thanks to ELSPA for advising TEEM of appropriate games titles to use for the purpose of this evaluation.

Titles used were:

Age of Empires II  
Bob the Builder  
Championship Manager  
City Traders  
F1 Racing Championship  
Freddi Fish  
Lego Alpha Team  
Legoland  
Micro Racers  
Pajama Sam  
Putt-Putt Enters the Race  
RollerCoaster Tycoon  
Sim City 3000  
The Sims  
The Tweenies  
The Settlers  
Uno  
Worms United

# Report on the educational use of games

An exploration by TEEM of the contribution which games can make to the education process



**TEEM** [www.teem.org.uk](http://www.teem.org.uk)

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**Ysanne Heald**