

Appendix 1: Initial interview structure and crib sheet

Thank you for taking part in this interview, which should take no more than one hour.

Are you happy for me to tape record the session?

Background

Sex / Age (Under 20 / 20 – 29 / 30 – 39 / 40 – 49 / 50 – 59 / 60 +)

What is your educational background?

What is your experience with computers?

Attitudes to gaming

What do you understand by the term 'game'? What makes something a game?

Do you play games? If so, what types do you play / enjoy?

Why do you play games / why don't you play games?

If you do play games:

What type of games do you enjoy / not enjoy? Why?

Do you play computer games? Why / why not?

If so, what types of computer games do you enjoy / not enjoy? Why?

Leisure activities

Which activities do you do in your leisure time?

What are the aspects of these activities that you enjoy? Why do you do these activities?

Do you use your computer for any leisure activity (apart from games)? If so, what?

Attitudes to learning

Describe to me how you would go about learning something new (facts, skills).

Would you consider using a game to learn? Why / why not?

Have you ever used games / computer games for learning? What was your experience?

Types of games

Computer

adventure / role-play / shooter / simulation / multi-player / quick (solitaire, minesweeper)

Board

monopoly / chess / draughts / go

Gambling

roulette / slot machines

Cards

poker / bridge / snap / solitaire

Active

football / golf / bowling

Quiz

trivial pursuits / quiz machines / pub quizzes

Other activities

Active

walking / gardening / running / cycling / travelling

Reading

fiction / non-fiction / technical / magazines / newspapers

Creating

painting / modelling / pottery / writing / cooking / playing a musical instrument

Passive

television / cinema / listening to music / concerts / art galleries / museums

Social

meeting friends / pub / eating out

Learning

evening classes / languages

Collecting

stamps / train spotting

Campaigning

politics / charity / religion

Purchasing

shopping / window-shopping / internet-shopping

Thinking

puzzles / crosswords

Appendix 2: Example transcript segments

Excerpt from Interview H

Why do you play games?

Because it's good fun. I sometimes, if I'm feeling competitive, I like winning, but then it doesn't matter if I don't if it's a good fun game. Pictionary, I like Pictionary and I quite like, em Chris has got one which is a sort of a riddle game, but no I really will play anything, I'll play Ker-plunk or anything that anyone says 'do you want to play?'

So is there any game that you wouldn't play?

Chess.

Why's that?

'Cause it's too much forward planning and strategic thinking and I just can't be bothered when you play with people who take half an hour to make a move. Ugh! <laughs> I just can't be doing with that. Other than that, no, I can't think of anything I wouldn't play.

Do you play computer games?

A little bit, not massively, because I don't have that many but probably if I did have I would play.

Which sort do you play, or have you played?

I play Scabby Queen, its one of these card ones, pass the, you've got to pass the Scabby Queen and then...

Do you play that online or on your own?

No, no, no, that's just on the computer, and I've got Patience and I play that and Chris has a very good one called Brain Drain, which I play, you know that? [*I don't think so.*] No? It's quite good.

What type of game?

That is, you get all sorts of little shapes and then, basically what happens is you get an example of shapes you meant to be like... for example it'll randomly generate a thing that you have to follow and by rotating them you've got to get the same shape, and it's a timed thing. And when Myles was small we used to play this, I suppose you call it an adventure game, and it was in China and you had to go up all these different levels and get magic potions and duh-duh-duh-duh... I found that quite tedious.

Why's that?

'Cause I kept getting chucked back to the beginning and I'd have to go through the whole lot again and I don't like that.

Anything else, other computer games that you play?

I don't know. I used to play Pac-man, does that count? [*Oh yes.*] Years ago, when we lived in Paris I played that one. Yeah. But no, because I don't have a vast collection of them I don't necessarily play that many, but if I did have you know I would, I would waste hours.

Why's it a waste?

Well because you're not doing anything productive are you, you're playing and it is a waste of time. I was going to say something and it's gone... I think Mavis Beacon, Teach Yourself Typing, I think that's a game, I spend hours playing that.

Excerpt from Interview D

Okay, so do you play games?

No <laughs>. Not really, but I take my broad sort of definition of what I would call a game, and I guess I'm including sports and leisure activities in this as well then I do enjoy doing a number of things, mostly individual activities, running for example, and I get quite competitive with myself about that in terms of paying quite close attention to how far I'm running, times, and things like that although recently I've been frustrated by the fact that I haven't had much time to do things like that, so yes, running, although that's not really a game but I see it was something where I'm sort of like competitive against myself. Em... in the past I have been involved in competitive sports, I was really quite into Karate and martial arts in general when I was younger, I certainly enjoyed the discipline side of it, and the different ways to challenge yourself doing something like that, yeah, quite often that would involve taking part in competitions and, you know, sometimes sparring against other people from other clubs and things like that so I have participated in games in a broad sense in the past... I have occasionally played computer games although there aren't any games that I'm a particularly big fan of, and I'm not, I wouldn't, I'm a dabbler more than anything else, I have played computer games before, I have played some competitive physical games before but no, on the whole, I wouldn't really say that I play games now... [*okay*] particularly often.

Why do you think that is?

I get quite bored of, well in terms of em, if we talk in a broader sense about sports and physical games and leave aside the issue of computer games just now, I get quite bored with the competitive element of it, where that's involved. Not sure exactly why that is but I find them more, I find it more rewarding when it's something that I'm sort of doing myself to challenge myself, also I find that one of the reasons I like undertaking the sort of activities that I do is physical relaxation, and I find something like running or even sort of like circuit training,

which I used to do a lot of, I find that more relaxing when it's just you yourself testing yourself, if you like, I find that much more relaxing than competitive situations which I don't find particularly stressful as such but I don't like the way that other people get stressed in those situations. In terms of other types of games, well I guess that most people, perhaps I should have mentioned this before now I start thinking about it in a bit more detail, I do now and again play board games and things like that, those I don't mind at all, they're usually just part of a social activity where we've got friends round, whatever, wouldn't always chose to play board games but I don't mind taking, you know, I don't mind playing them when I know it's just fun, there's nothing in it. Computer games, video games, things like that as I say I've played those in the past and, mostly when I was younger than now, but I was never a huge fan or a huge game player. My main reason now would be that I spend most of the day of my working week staring at computer screens, doing things with computers, I don't particularly want to go home at the weekends or in the evenings and sit and play computer games where again I'm staring at digitised images on a screen, it's not something that appeals to me mainly for that reason, nothing more that really, you know we own a games console, which we get out now and again but it tends to be the kinds of thing we do, either myself and my partner will play a few games against each other on one game or another or I'll get it out myself but it tends to be a last resort, nothing on the TV, can't go out for whatever reason, nothing on the radio, don't fancy any of the board games then we'll dig the games console out but it's really a boredom breaker more than anything else.

Okay, you mentioned that you played computer games in the past, what types did you particularly like playing, what types have you tried?

I'm no expert, but I guess what they sort of call platform games, the main one I remember when I was younger was Jet Set Willy, a popular game in the early eighties where you'd run around this house, all the different levels, collecting things and so on, that was the main one and I guess I got into that because all my friends played it. There were various other games that were similar to that, what did I like about those, I liked the sort of exploratory aspect of them and just that fact that they were quite light-hearted and not particularly, you know, they weren't much of a brain drain, they were fairly simple games, yeah, they just took up some time for a little while.

Okay, are there any types of games that you can think of that you really don't get, that you just wouldn't play, that you don't understand why people play them?

Again, the sort of games that I think I don't like, well they're really just based on sort of general impressions I've got, what those games are and what they involve, maybe the impressions I've got about the people that play them, so this isn't really from any sort of well-experienced point of view or anything. I find myself bored rigid when I've ever tried to play any fantasy-type game where you're sort of like assuming the role of a character and be trying to solve puzzles and riddles and things like that...

Appendix 3: Game play questionnaire

Please take a few minutes to answer all the questions on this sheet as honestly as possible. Your help is very much appreciated.

Age under 20 / 20–29 / 30–39 / 40–49 / 50–59 / 60 plus

Sex male / female

Have you ever played computer games? Yes / No

Do you play computer games now? Never / Occasionally / Regularly

If you do play computer games, what types do you play? (You can select more than one.)

Adventure Simulation Puzzle Multi-player

Role-playing Shooter Strategy Platform

Other _____

If you do play computer games, why? (You can select more than one.)

Playing with others Mental challenge Physical challenge

Boredom To make social situations easier

Other _____

Do you play any other types of games? Yes / No

If yes, what types do you play regularly? (You can select more than one.)

Board games Card games Gambling Sports

Quiz games Puzzles Role playing

Other _____

Please turn over to complete the questionnaire.

If you do play other types of games, why? (You can select more than one.)

- Playing with others Mental challenge Physical challenge
- Boredom To make social situations easier
- Other _____

Have you ever played an educational game? Yes / No

If yes, please give details.

Are you motivated by the idea of learning with a game? (Please select one only.)

- You would be positively motivated
- It would not motivate you either way
- You would not like the idea of learning with a game

Thank you for completing this questionnaire.

If you would consider being interviewed during the next stage of this research, please provide details of your name and email address.

Name _____

Email _____

If you would like further information about this research, please contact:

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Appendix 4: Contingency tables

Propensity to play computer games for leisure against motivation to learn with games

		Motivation to learn with games			Total
		1 Yes	2 Neither way	3 No	
Propensity to play computer games	1 Never	18	7	1	26
	2 Occasionally	54	16	5	75
	3 Regularly	53	33	11	97
Total		125	56	17	198

Note: 2 cases have been removed where data are missing

Propensity to play games for leisure against motivation to learn with games

		Motivation to learn with games			Total
		1 Yes	2 Neither way	3 No	
Propensity to play games	1 Yes	99	44	12	155
	2 No	26	12	5	43
Total		125	56	17	198

Note: 2 cases have been removed where data are missing

Appendix 5: URLs for games used for review

Avatar High

<http://www.the-n.com/games/avHigh/ahigh.php>

Bookworm

<http://www.shockwave.com/sw/content/bookworm>

Bootlegger

<http://mysterymanor.net/bootlegger/index.htm>

The Crimson Room

<http://www.ebaumsworld.com/crimsonroom.html>

Grow

<http://www.eyezmaze.com/grow3/>

Hamlet

<http://www.robinjohnson.f9.co.uk/adventure/hamlet.html>

iSketch

<http://www.isketch.net/>

Laser Beams

<http://www.microprizes.com/mp55.htm>

Law and Order II

<http://www.shockwave.com/sw/content/lawandorder2>

Lemonade

www.lemonadegame.com/

Mini golf

<http://www.electrotank.com/playGame.electro?gld=119>

The Mystery of Time and Space

<http://www.albartus.com/motas/>

Runescape

<http://www.runescape.com/>

Samorost

<http://www.amanitadesign.com/samorost/>

Typer shark

<http://www.shockwave.com/sw/content/typershark>

Whizzball

<http://kids.discovery.com/games/whizzball/whizzball.html>

Appendix 6: Introduction to effective group work

At the end of this session, you should:

- know what a group is and to be aware of the elements that make a group effective;
- appreciate the benefits of working as a group, and be able to communicate and collaborate successfully with others;
- be able to successfully work together to problem-solve and reach effective decisions.

Effective groups

A group can be defined as:

- three or more people;
- with a common goal;
- who work together and influence each other;
- and see themselves as a group.

Learning about how to work together in small groups is important because, as humans, group membership is an integral part of our lives and groups are central to our family lives, work lives, education and psychological health.

Getting to know and trust the other group members is a vital first step to working together effectively. There are a number of ways to develop an atmosphere of trust:

- be open in sharing information, thoughts and feelings, materials and resources;
- show a willingness to accept each individual and their contributions to the group;
- support each other and recognise the strengths and weaknesses of each person.

For small groups to work well, they should also have **positive interdependence** and **individual accountability**. Positive interdependence means that achieving the goal relies on the group working together rather than as single individuals; but individual accountability means that people are personally responsible for achieving their own tasks and helping others achieve theirs.

Explicit goals are also important for any effective group. Goals should be clear and common to all group members. The first job of any group should be to determine, modify and clarify its goals until a consensus exists that is understood by all members. Conflicts of interest, where there are differences between group and individual goals, should also be considered.

Group reflection is also important for maintaining an effective group. The group should consider periodically how they are functioning and plan to improve the work processes in the group.

Working collaboratively

Working collaboratively can bring a number of benefits, including:

- allowing people to work to their strengths and preferences;
- bringing together a range of skills, approaches and knowledge;
- development of improved solutions through critical discussion;
- being able to achieve goals quicker and more effectively;
- social benefits and peer support.

Effective communication is central to collaboration. When communicating with others:

- use personal pronouns to talk about your opinions (e.g. “I think that the sky is blue” rather than “The sky is blue”);
- make sure that what you say is complete, clear and specific;
- make the message appropriate and relevant to the person receiving it;
- ask for feedback on whether others understood what you were saying; if you are not sure you understand something, ask for clarification;
- describe behaviour without evaluating it, and describe the effect that it has on you (e.g. “When you shout it makes me feel upset” rather than “It is wrong for you to shout”).

Fun and humour are an important element of relationship-forming and group communication; however, this can be culturally-specific and exclusive, so it is important to be sensitive to this and careful that jokes, sarcasm, or banter is not misconstrued. Always give others the benefit of the doubt if you think it's possible you may have misinterpreted something, and ask for clarification.

Making decisions in groups

Group decision-making is often more effective because:

- group discussions lead to more ideas and insights;
- incorrect solutions are more likely to be recognised and rejected;
- groups have a more accurate memory of facts and events;
- groups have the confidence to make riskier decisions.

Decisions can be made by groups in a number of ways, for example by the leader with or without discussion, by an expert group member, by a sub-group, by the majority vote, or by consensus. Consensus is the best option for high-quality decisions, which are innovative and increase commitment.

An effective decision can be described as one where:

- the group uses all the resources available;
- time is used well;
- the decision is thought to be a good decision (in that it is acceptable, realistic and likely to have a good outcome);
- the ability of the group to work together is increased.

Controversy is often seen as being destructive, rather than a constructive method of decision-making. This can be because people are afraid of confrontation and do not know how to effectively engage in controversy.

To use controversy constructively for decision-making:

- Be aware of the common need to make the best decision possible.
- Avoid arguing blindly for your own opinions but present your position as clearly and logically as possible,
- Encourage others to advocate their positions and listen to other members' reactions and consider them carefully before pressing a point.
- Understand, then challenge, opposing ideas and positions. Differences of opinion should be sought and discussed and all people should be encouraged to participate.
- Do not take personally other members' disagreements and rejection of your ideas.
- Synthesise the best ideas from all viewpoints and perspectives.

Appendix 7: Time Capsule character briefings

Professor Hilary Dustbuster

You are a well-respected local historian, and made your name heading the faculty of local history at the local university. Your research is famous for several miles around and you are best known for your controversial investigations into the role of badgers in local history.

You are keen on preserving any items that relate to local history, particularly those that are graphical, such as paintings or photographs.

You have a particular interest in keeping alive the memory of your great aunt Augusta Dustbuster, a local poet.

Three months ago, you made the greatest find of your career. While excavating on Old Mill Hill you discovered ancient badger bones; you believe this proves the existence of a Roman settlement in the area.

You are a very serious person with a dislike of all things frivolous, such as music, laughter, cats and cake.

However, in your younger years you were the lead singer in the girl group 'Hilary and the Hornets'. This is now an extreme embarrassment to you and you want to obliterate every memory of the group.

In your spare time, you are an enthusiastic taxidermist.

Another particular area of interest for you is the manufacture of whiffling spoons in Tudor times. Whiffling spoons were used to scoop the scum (or 'whiffle') from the top of badger stew, a local favourite of the era.

Your best-selling (in the local historical non-fiction charts) book, "Badger Quest: Beyond the Myth" is, you feel, one of your finest achievements.

Felix Grubb

You are one of the town's leading businessmen. You own a lucrative chain of butchers' shops, are head of the Chamber of Commerce and close personal friend of the Mayor. You give a lot of money to local charities (but you don't like to talk about it).

You have no relatives to carry on the family name or the family business so it is extremely important for you that you are remembered in some way by future generations.

You are rightfully proud of the prize-winning sausages produced by your firm; however, their image has never really recovered since the unfortunate food-poisoning incident at the Mayor's inauguration banquet. Even now, thinking of that day upsets you.

You were very upset recently when some old movie footage of American soldiers during WW2 was discovered, which contained many disparaging comments about Grubb's sausages.

You are known for your knowledge of fine foods and wines and your love of all things culinary.

Your messy divorce from local potter, Petra Pottington, last year has left you emotionally embittered.

You are a huge sports fan, and your particular hero is Wilbur Grace, who captained the local rugby team to league victory seven times between 1930 and 1945.

As part of its charitable works, Grubb's has for many years sponsored activities in the local schools, including the Doomsday project and yearbook production.

Despite your wealth, you are a man of the people and feel that precious objects should be made publicly available in museums and galleries. The thought that any such works of art should be included in the time capsule is abhorrent to you.

Dr Catherine Makewell

You are the town's local GP. You are known as a strict woman of principle and are well respected by all who know you. Your knowledge of local ailments is second to none.

You have always been a strong advocate of natural foods and healthy eating and have been a staunch vegetarian since suffering severe food poisoning at the Mayor's inauguration banquet. You are teetotal and campaign strongly for the banning of all alcohol.

A distant ancestor of yours, "Dirty" Dick Makewell was a notorious highwayman and was hanged in 1837. You are deeply ashamed of this.

Your sister is married to local celebrity Seth Bainbridge and you have secretly always harboured a passion for him.

You are a fervent animal lover and were devastated when your prize-winning cat, Snookums, died last year after a long and successful show career. You buried Snookums in your favourite spot on Old Mill Hill and were upset recently when you discovered that the remains had been disturbed. You blame the local children.

You were a key member of a research team that developed wonder drug Omexon 6, which can cure a range of ailments. Its use has been limited at the present time, however, owing to its toxic effects on badgers.

You have a long-running feud with the head teacher of the local school, Dorothy Spiggot, who you accused of stealing your recipe for lemon drizzle cake.

Your best friend is local potter, Petra Pottington.

You are old-fashioned in your tastes and dislike noisy modern music. In fact, there has never been a song that tops your all-time favourite from 1963, "Bing Boom a Bang Bang" by Hilary and the Hornets.

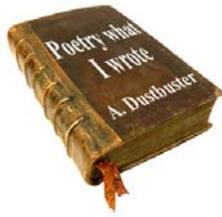
Mayor Titus Bobbins

You are the esteemed Mayor of the town. The time capsule is your idea and will be named after you, so you don't really care what goes into it (after all you'll be long gone by the time it's opened).

What you do care about, however, is making sure that the capsule is ready in time, contains the correct number of items, and comes in on budget (or preferably below budget).

You will not agree to any selection of items that go above the budget of £1,000.

Appendix 8: Time Capsule object list



1. Poetry book

£500

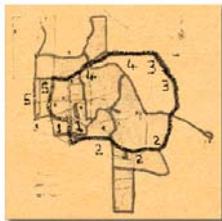
A first edition of 'Poetry what I wrote' by Augusta Dustbuster. One of the few surviving copies of this little-acknowledged work by the local poet.



2. Sausage selection

£100

A vacuum-packed crate containing a selection of Grubb's prize-winning sausages, black puddings and assorted offal.



3. Map of the town

£600

A hand-crafted map of the town and its environs, specially commissioned from master cartographer and celebrity pilot, Seth Bainbridge.



4. Lemon sponge

£50

A hermetically-sealed Tupperware box containing one of Dorothy Spiggot's famous lemon drizzle cakes.



5. A photograph of the High Street

£100

This photograph was taken on the day of the Mayor's inauguration and shows happy crowds. The Mayoral party looks somewhat nauseous.



6. A rosette

£200

Final rosette awarded to famed local cat, Snookums, at the County Cat Show. Sadly Snookums has since died.



7. Movie film

£100

Original movie film of the town during the war, including extensive interview footage with American GIs stationed at the nearby air base.



8. Cine projector

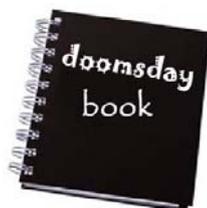
£500

Projector for showing reel-to-reel movie film.



9. A painting **£600**

A painting of the Old Mill in 1873, by famous artist Vincent van Driver.



10. The doomsday book **£100**

A somewhat amateurish effort by the town's school children to reproduce the Doomsday book, undertaken in 1983. With pictures.



11. A signed photo **£150**

A signed photo of local sporting hero, rugby player Wilbur Grace.



12. Petra's Pot **£250**

A charming example of the potter's art created by local potter, Petra Pottington.



13. Yearbooks **£50**

A copy of every yearbook from the local school since the custom was adopted in 1994.



14. Newspaper **£50**

A laminated copy of the local newspaper from the day that the capsule goes in to the ground.



15. A phial of Omexon 6 **£600**

Enough Omexon 6 to enable future generations to develop their own production facility.



16. Magazine **£50**

A copy of 'Flavours of the Country' from 1973, featuring in-depth article about the high quality of sausage production in the area.

**17. Record****£100**

A rare copy of 'Bing Boom a Bang Bang', by local group, Hilary and the Hornets, which made it to number 23 in the charts in 1967.

**18. Stuffed badger****£300**

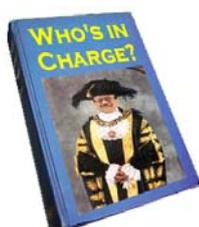
Prize-winning work of acclaimed local taxidermist, Ebenezer Sponge.

**19. Local beer****£50**

A keg of the much-praised 'Old Tubthumper' local ale, brewed on the premises of the Stag and Raven pub.

**20. Manuscript****£700**

A copy of the manuscript of 17th-century composer Michel Flaubert's masterpiece 'The Old Mill', thought to have been composed while staying at the Old Mill.

**21. A copy of Who's in Charge?****£100**

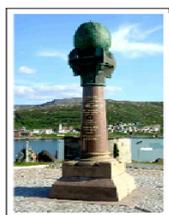
A compendium of all the speeches of the Lord Mayor (autographed).

**22. Animal bones****£300**

Animal bones recently discovered on the Old Mill Hill. They are believed to be of Roman origin.

**23. A genuine Tudor whiffling spoon****£600**

An unusual artefact, unique to the local area.

**24. Photograph of the Grubb monument****£50**

Framed photograph of the centrepiece of the town square, named after Sir Hubert Grubb, one of the town's founding fathers.

-  **25. Highwayman's hat** **£300**
Believed to belong to legendary local highwayman and philanderer "Dirty" Dick Makewell.
-  **26. Globman's fudge** **£50**
A party box of the celebrated local confectionary.
-  **27. Limestone rocks** **£50**
A sample of the local building and walling material.
-  **28. History book** **£250**
A signed copy of 'Badger Quest: Beyond the Myth' by H. Dustbuster.
-  **29. Hunting horn** **£200**
Silver hunting horn used on the annual badger-drive between 1730 and 1910, before such barbaric practices were outlawed.
-  **30. Cricket bat** **£500**
The cricket bat that won the local team's historic town championship victory in 1932.

Appendix 9: The Time Capsule Exercise Instructions

In its wisdom, your local town council has decided that the best way to spend its spare revenue is to invest in putting together a time capsule, containing six items of interest to future generations, not to be opened until the year 3006. It is hoped that this capsule will provide a unique insight into life in your town.

The council has a budget of £1,000 and the Major is adamant that this can not be exceeded, so to help him make the all-important decision about which items to select for the capsule, he has invited three prominent local citizens to help him.

You will be acting as one of these people, and will be provided with:

- an information sheet giving you details of your character;
- a list of potential items for the time capsule.

You have 40 minutes to agree on the six items that should be placed in the capsule. All of you must agree.

Part 1: Getting to know the other group members

Spend a few minutes introducing yourself to the other members of the group (in character).

Agree as a group what your group goal is and your constraints (e.g. time, money, etc.) Feel free to share as much (or as little) information as you wish about your character's personal goals.

Once you know who everyone else is, move on to Part 2.

Part 2: What can we put in the capsule?

You have thirty potential items available to put in the capsule. Some of the items are specialist and you may need help from the other characters to find out what they are and what value they might have to future generations.

Spend the next ten minutes making sure that all members of the group know what all the items are and are aware of their merits. Don't spend time at this stage arguing for particular items to go into the capsule, just make sure that everyone is informed.

When all group members are happy with this, you can move on to Part 3.

Part 3: What shall we put in the capsule?

In this final stage, your group must come to a decision, which is acceptable to all parties, about what should go into the capsule.

Your character sheet will give you more detail about the items that you think are important.

All characters must agree on the final decision. You must not go over the budget of £1,000.

Appendix 10: Debriefing Exercise

The purpose of this exercise was to give you some experience of working collaboratively as a group, to achieve a definite goal with limited resources and time.

It does not really matter how you performed in the exercise or whether you achieved the objective in time, what is more important is thinking about the process by which you communicated with each other and made decisions, how effectively you negotiated with others, and what you can learn from that process.

You do not need to write anything down, but take ten minutes to discuss the following questions with your group:

The outcome:

- Did you manage to reach a conclusion that was satisfactory to everyone in the time?
- If not, what stopped you doing this?
- Which behaviours were positive for the team? Which were negative?
- What could you have done that would have led to a better outcome?
- How did you decide on what to do? Do you think the group made good decisions?
- Do you think this was fair? Would there have been better ways to decide?

Group processes:

- Did you take time to find out who everyone else was?
- Did you agree about the group goal? If not, would this have been useful?
- Was everyone open to sharing information? Were you willing to trust others and share?
- Was there controversy within the group? Did you use this constructively?

Communication:

- Were you given the opportunity to make your points? Did you give other people the chance to make theirs?
- Did you clarify that you understood the opinions and ideas of others?
- Did you really work as a group or as individuals?
- What could you do to improve the ways in which you communicated and worked with others in the group?

Appendix 11: Detailed design of the Pharaoh's Tomb

There are six separate areas that need to be solved in the Pharaoh's Tomb. At the start of the game, each player has a different object, these are: ankh; whip; key 1.

Items in brackets were included in the original design but were removed from the final version of the game.

1. Entrance		
Purpose	Objects	Puzzles
Training area. Practice manipulating objects.	Movable: <ul style="list-style-type: none"> • Bucket • Key 2 • Bamboo Stationary: <ul style="list-style-type: none"> • Tap • Fire • Chest • Door • (Ankh hole) 	Remove fire to reach chest <ul style="list-style-type: none"> • fill bucket at tap • use full bucket on fire Open chest <ul style="list-style-type: none"> • use key 1 on chest • take key 2 from chest Open door <ul style="list-style-type: none"> • use key 2 on door • (use ankh in hole)

2. Scarab room		
Purpose	Objects	Puzzles
More difficult interactions, practise working together.	Movable: <ul style="list-style-type: none"> • Scarab piece 1 • Scarab piece 2 • Scarab piece 3 • Knife • (Paper) Stationary: <ul style="list-style-type: none"> • Scarab picture • (Ankh hole) • (Code entry) 	Find scarab piece 1 <ul style="list-style-type: none"> • use whip on shelf Find scarab piece 2 <ul style="list-style-type: none"> • use bamboo and knife to make flute • use flute to charm snake Find scarab piece 3 <ul style="list-style-type: none"> • fill bucket with water • use water in urn (Get piece of paper <ul style="list-style-type: none"> • get code by turning paper upside down) Open door <ul style="list-style-type: none"> • place scarab pieces in picture • (use ankh in hole) • (enter code)

3. Labyrinth		
Purpose	Objects	Puzzles
Forces collaboration by making players guide another player through a maze	Movable: <ul style="list-style-type: none"> • Cat's eye jewel 	Only one player can enter the labyrinth. Player who enters loses access to map and must be guided through by other players. <ul style="list-style-type: none"> • Get cat's eye jewel

4. Riddle room		
Purpose	Objects	Puzzles
Forces collaboration by making players communicate between rooms to solve a code	Stationary: <ul style="list-style-type: none"> • Code scroll • Code input Movable: <ul style="list-style-type: none"> • Cat's eye jewel 	Only one player can enter the riddle room. Player who enters can see a coded riddle, but the code is outside the room so players must work together to decode and solve the riddle. <ul style="list-style-type: none"> • Rewarded with cat's eye jewel

5. Cat room		
Purpose	Objects	Puzzles
Lateral thinking, working together to find out how to leave the room.	Stationary: <ul style="list-style-type: none"> • Code key scroll • (Ankh hole) 	Open door <ul style="list-style-type: none"> • Place jewels in eyes of cat picture • (Use ankh in hole)

6. Pharaoh's anteroom		
Purpose	Objects	Puzzles
Forces communication and tests teamwork.	Movable: <ul style="list-style-type: none"> • Gold Stationary: <ul style="list-style-type: none"> • Platform • (Ankh hole) 	Room contains two doors. (To open one door <ul style="list-style-type: none"> • use ankh in hole) The open door reveals a platform, which, when held down, opens the door to the tomb. One player must hold the platform while another enters the tomb. <ul style="list-style-type: none"> • Return ankh to Pharaoh. • Rewarded with gold. The player in the tomb can now leave with the gold, or return to the platform and use the gold to weigh it down so that the whole team can escape.

Appendix 12: The Time Capsule Online Instructions

In its wisdom, your local town council has decided that the best way to spend its spare revenue is to invest in putting together a time capsule, containing six items, to be opened in the year 3006. It is hoped that this capsule will provide a unique insight for future generations into life in your town.

The council has a budget of £1,000 and the Mayor is adamant that this can not be exceeded, so to help him make the all-important decision about which items to select for the capsule, he has invited three prominent local citizens to help him.

You will be acting as one of these people, using an online real-time collaborative application. Within the interface you will be provided with:

- information about your character;
- a set of potential items for the time capsule.

(More detail about the application interface is shown on the next page.)

You have 40 minutes to agree on the six items that should be placed in the capsule. All of you must agree.

Tips for effective team working

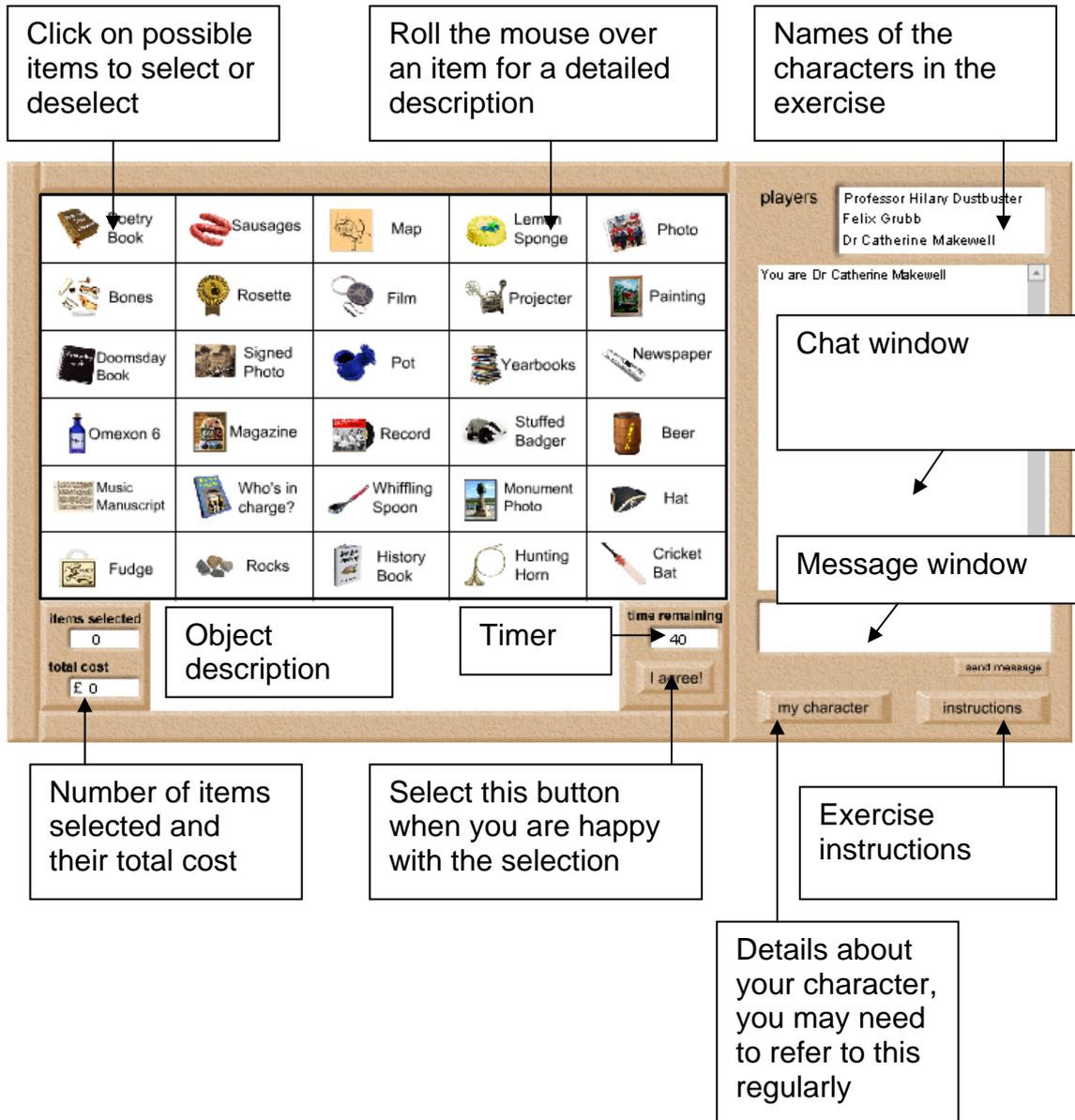
- Spend a few minutes introducing yourself to the other members of the group (in character).
- Agree as a group what your group goal is and your constraints (e.g. time, money, etc.) Feel free to share as much (or as little) information as you wish about your character's personal goals.
- You have thirty potential items available to put in the capsule. Some of the items are specialist and you may need help from the other characters to find out what they are and what value they might have to future generations.
- Your group must come to a decision that is acceptable to all parties, about what should go into the capsule. Your character information will give you more detail about the items that you think are important.

All characters must agree on the final decision. You must select six items and you must not go over the budget of £1,000.

The Interface

When you first log in you will see the information about your character. Close this window using the close button in the top right-hand corner (you can always open your character information again using the 'my character' button).

The interface should now look like this:



Appendix 13: The Pharaoh's Tomb Instructions

In 1921 the famous archaeologist Dr Idaho Smith led a successful expedition to recover the sacred treasure of Pharaoh Rameses III. Among the treasures discovered was a brass ankh (see right).



However, since the expedition to Rameses's Tomb, nothing has gone well for the Smith family and now the aged Dr Smith believes the ankh to be cursed. He has asked for volunteers to return the ankh to the tomb and you and two fellow intrepid adventurers have accepted the task of returning the cursed ankh to the Pharaoh.

Your group must:

- Return the cursed ankh to the Pharaoh.
- Ensure the whole team escapes from the tomb.

Once in the tomb you will be presented with a series of rooms that you must navigate through in order to find the pharaoh's tomb and return the ankh. You can pick up some objects and use them with other objects to help you in your quest.

You have only 40 minutes to complete this task before the air in the tomb becomes fatal.

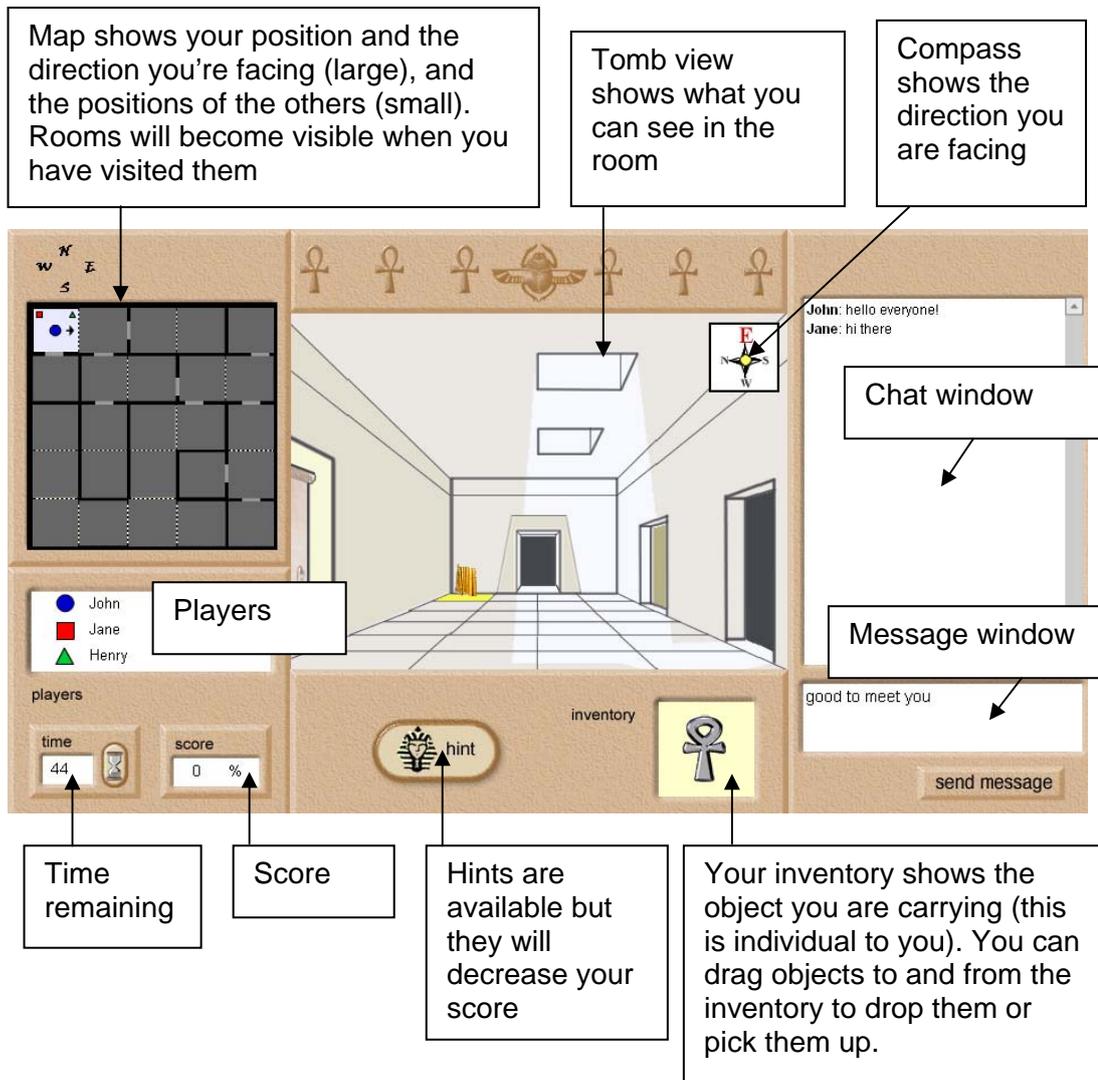
Tips for effective team working

- Spend a few minutes introducing yourself to the other members of the group and making sure that the whole group is comfortable moving around and handling objects.
- It is important that you make sure that all the members of your team are aware of what you are doing and what is going on. Don't let one of your team members get left behind.
- Your initial aim is to get through the first locked door. You will need to use objects together. Some objects can be picked up (e.g. the bucket) and others not (e.g. the tap). Using objects together will make things happen (e.g. using the bucket and the tap will fill the bucket).
- Each player will start with different objects and can carry only one object (that's three in total for the group). You will need to talk to each other to find out what everyone is carrying and think about how they can be used.
- If you get stuck, you can ask for a hint, but remember that you will lose points every time you do. You can save points by sharing hints with other members of your team.

The Interface

When you first log in you will see information about the first part of the tomb and what you need to do. Close this window using the close button in the top right-hand corner (you can always open it again by clicking on the scroll on the wall to the left).

The interface should now look like this:



Navigation

When you move your mouse around the Tomb View, navigation arrows will appear.

When the cursor is moved to the left or right you will see curved arrows, which will rotate you 90° left or right (↶ ↷).

When it is possible to go forward, a straight navigation arrow will appear, which will take you forward into the next square or through a door (↗).

Note that to go backward you need to rotate 180° and go forwards.

The map shows areas that you have visited, your position and the direction you are facing, and the positions of your other team members. (Note that if you can't see a player then they are probably in an area you haven't visited yet). Players' positions are denoted using the same icon as in the players window.

Using objects

Once in the tomb you must work your way through a series of rooms. There will be a number of objects available to you in these rooms. You can pick up some objects (only one at a time) and use objects with other objects.

Objects that you can pick up can be found on yellow hotspots. You can drag an item from a hotspot to your inventory to pick it up, or drag your inventory item to a hotspot to put it down. You must be right next to a hotspot to use it.

To use a movable object (e.g. bucket) with a non-movable object (e.g. tap) drag the movable object over the non-movable one (e.g. drag the bucket over the tap).

To use two movable objects together drag either one over the other.

Scrolls

When you enter a new area a scroll will appear telling you what you have to do.

It is important to read the scrolls when you enter each room, to find out what you should (and shouldn't) do in that room.

Each of these scrolls also hangs on the wall of the room it appears in, so once you have closed the scroll you can view it again by clicking on the scroll in the room.

Scoring

When you achieve things your score will increase, but you can also lose points, so think carefully before you act.

You will lose a point every time a member of your team asks for a hint.

You have 40 minutes to achieve the highest score you can, up to 100%. Remember though that the game is scored for the group – not for an individual. Good luck!

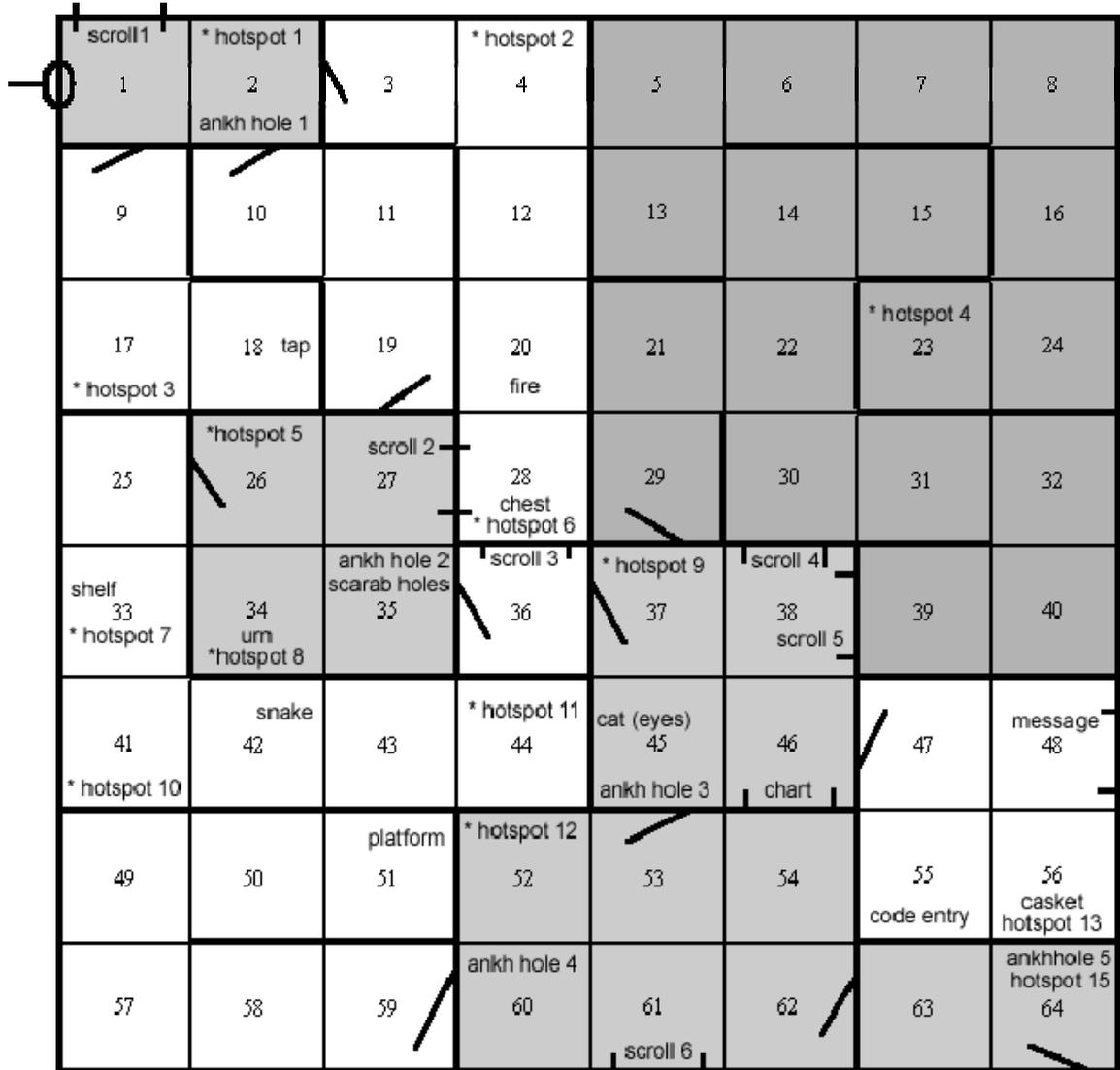
Appendix 14: Initial design of the Pharaoh's Tomb

Players start in square 1 facing east. They start with the following objects:

Player 1: Cursed ankh

Player 2: Whip

Player 3: Small key



Squares	Room	Objects
1, 2	Entrance	Scroll 1 Hotspot 1 (bucket) Door (locked) Ankh-shaped hole in the wall
3, 4, 12, 20, 28	Central corridor	Hotspot 2 Fire Chest (closed) Hotspot 6 (within chest)

5, 6, 7, 8, 13, 14, 15, 16, 21, 22, 23, 24, 29, 30, 31, 32, 39, 40	Labyrinth	Hotspot 4 (jewel)
9, 17, 18	North west corridor	Hotspot 3 (bamboo cane) Tap
10, 11, 19	Corridor	
25, 33, 41, 42, 43, 44	West central corridor	Shelf Hotspot 7 appears once whip used with shelf (scarab part) Hotspot 10 (paper) Snake Hotspot 11 (scarab part)
26, 27, 34, 35	Scarab room	Scroll 2 Hotspot 5 (knife) Urn Hotspot 8 appears once water used with urn (scarab part) Door (locked) Ankh-shaped hole in the wall Scarab hole (head) Scarab hole (left torso) Scarab hole (right torso) Combination lock
36	Central corridor	Scroll 3
37, 38, 45, 46	Cat room	Scroll 4 Scroll 5 Door (locked) Hotspot 9 Ankh-shaped hole in wall Cat statue right socket Cat statue left socket Hieroglyphic chart
47, 48, 55, 56	Riddle room	Hieroglyphic message Code entry mechanism Casket Hotspot 13 within casket (jewel)
49, 50, 51, 57, 58, 59	South west corridor	Platform
52, 53, 54, 60, 61, 62	Pharaoh's anteroom	Scroll 6 Hotspot 12 Door (locked) Ankh-shaped hole in wall
63, 64	Pharaoh's tomb	Ankh-shaped hole in coffin Door (locked) Hotspot 15 appears when ankh placed in hole (gold bar)

Appendix 15: Pharaoh's Tomb evaluation sheet

Date:

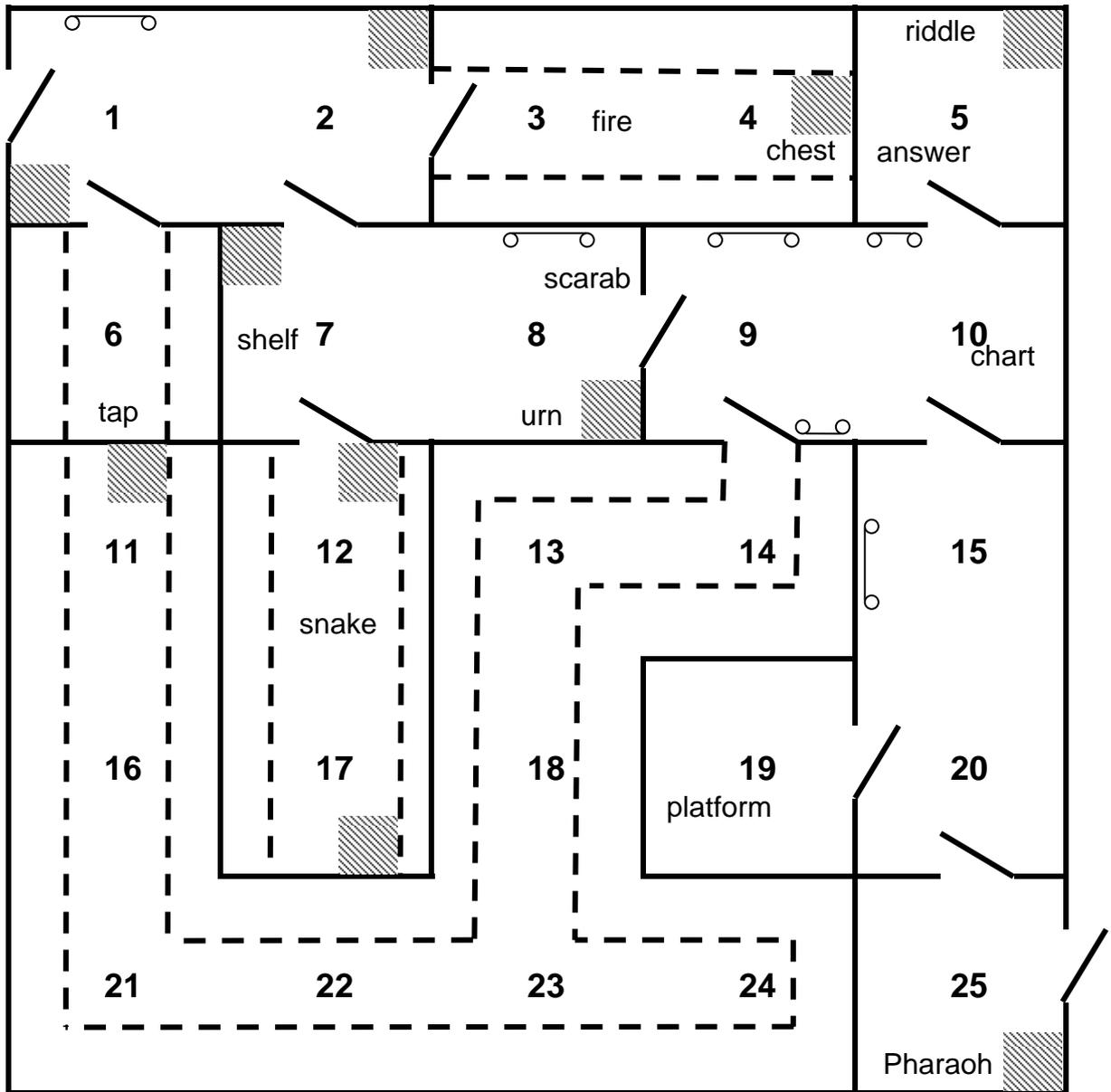
Players:

Time taken:

Puzzle	Notes	Bugs
Entrance		
Scarab room		
Cat room		
Labyrinth		

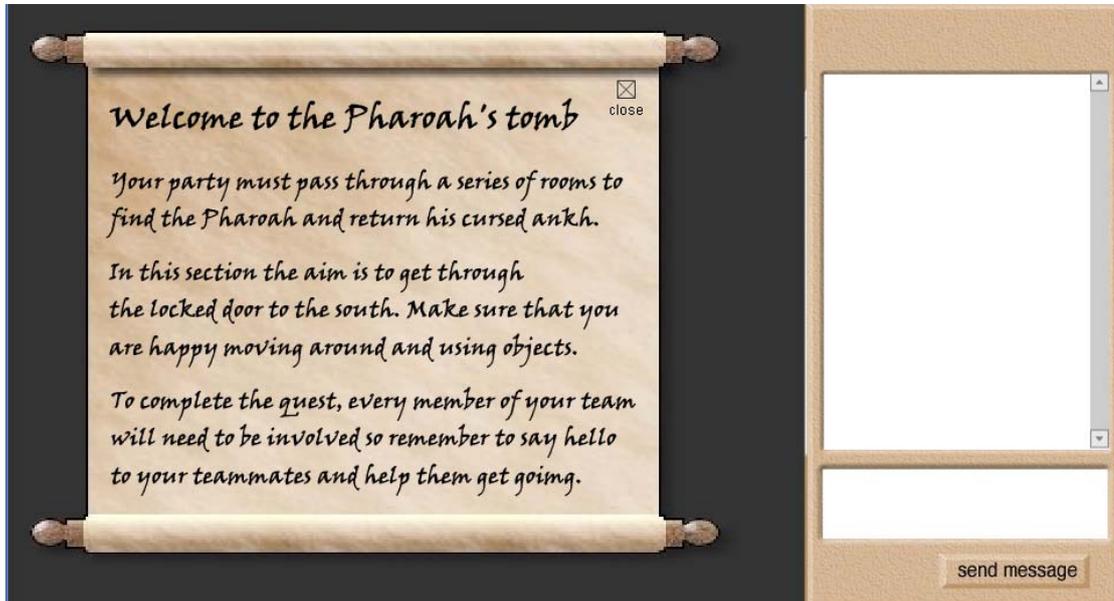
Riddle		
Anteroom		
Other, interface, navigation, interaction, etc.		

Appendix 16: Pharaoh's Tomb final design

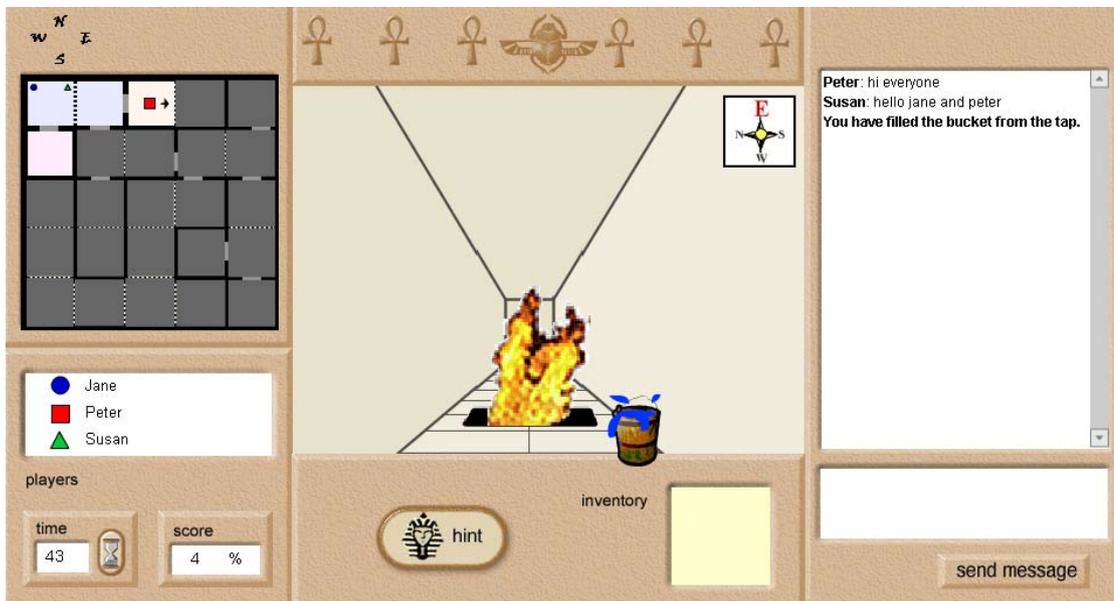


-  Hotspots
-  Information scrolls

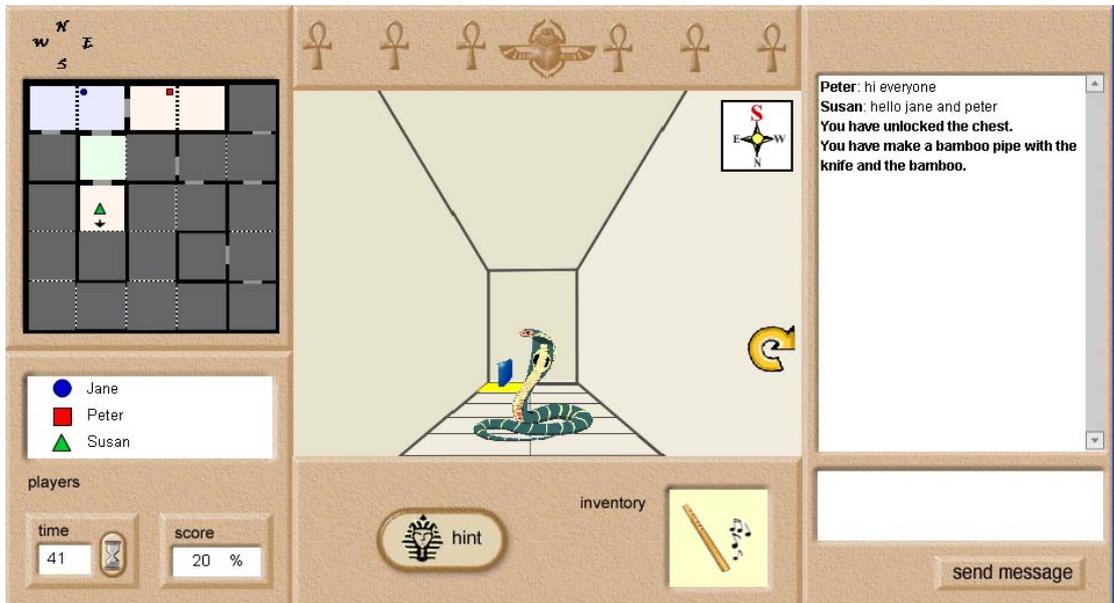
Appendix 17: Screenshots from the Pharaoh's Tomb



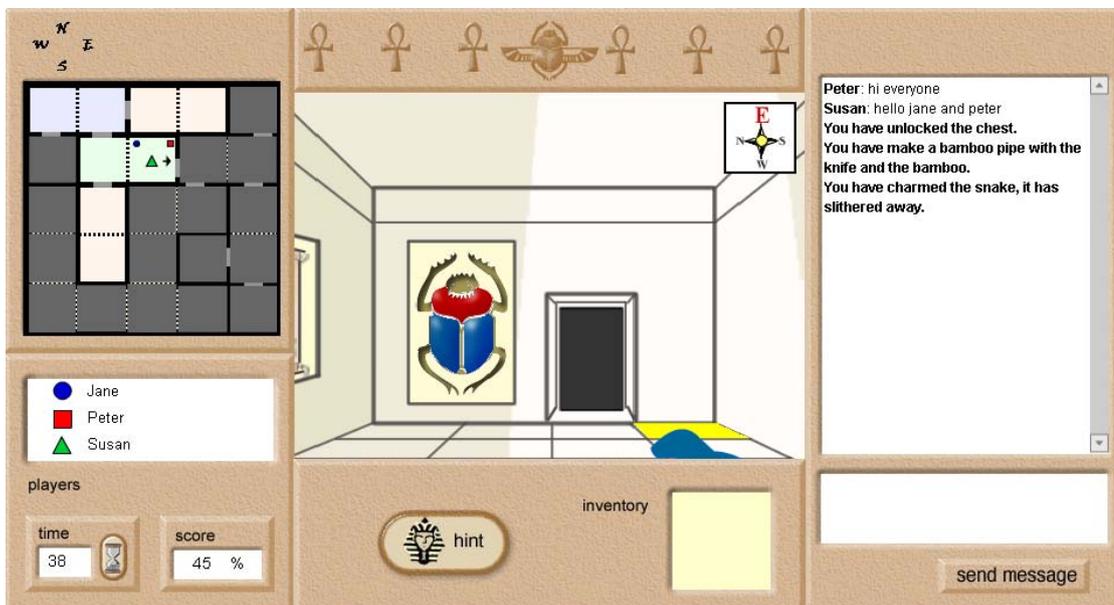
Starting the Pharaoh's Tomb



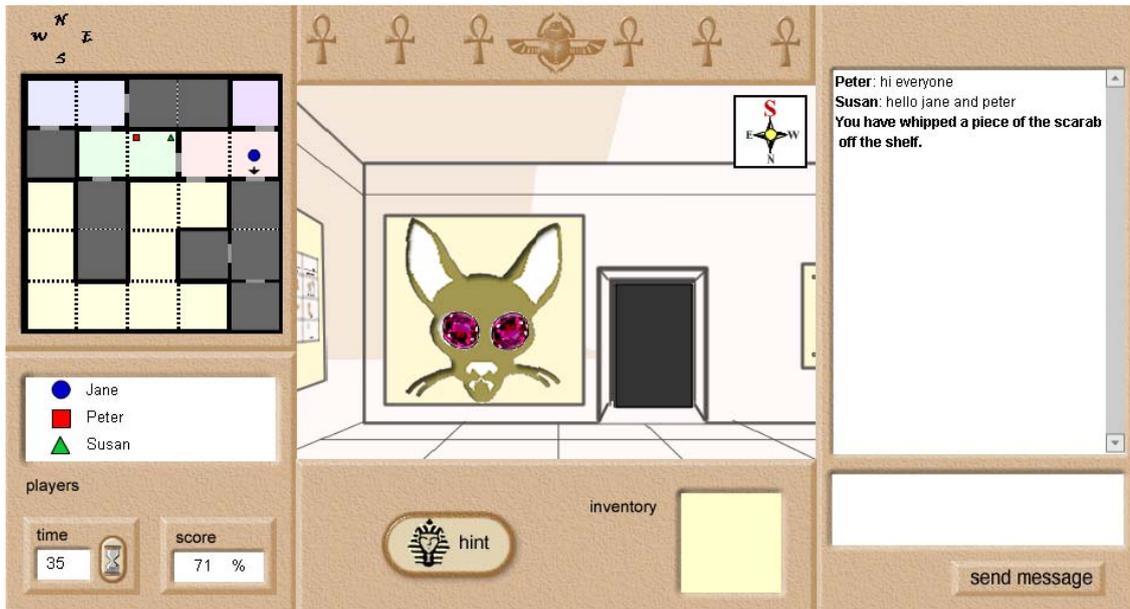
Putting out the fire



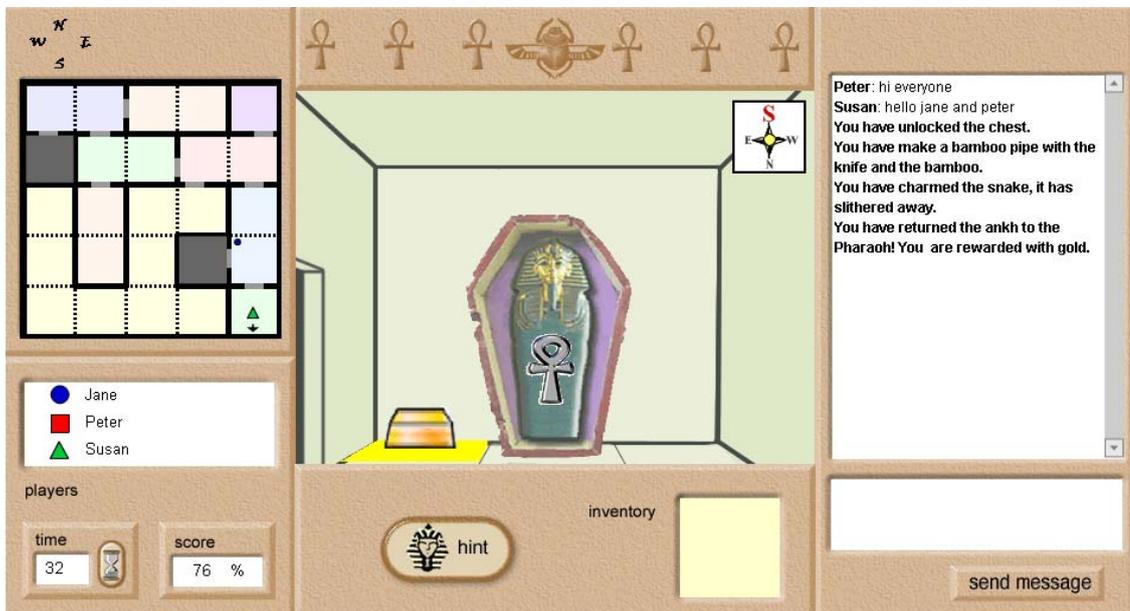
Charming the snake



Opening the door to the scarab room



Leaving the cat room



Returning the ankh to the Pharaoh and receiving gold

Appendix 18: Self-rated learning questionnaire

Please indicate whether you feel that using the activity has improved your understanding of the following concepts.

	Worse	Same	Improved
How to make good decisions as part of a group.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What makes communication effective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Constructive controversy as a way of making decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What makes a group effective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to be an effective leader.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to communicate with others in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ways of generating new ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The importance of group reflection for effective groups.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to contribute to group decision-making in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The roles that people take in teams.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The benefits of collaborating with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contributing to make group work more effective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Have you ever used a similar exercise before? Yes / No

Would you like to work with the same team again? Yes / No

How could the exercise be improved?

Any other comments?

Appendix 19: Original engagement questions

Note: R indicates that the scale of the question is reversed.

Challenge (made up of three sub-factors)

Motivation

- 4. I wanted to complete the activity
- 28. I wanted to explore all the options available to me
- 37. I did not care how the activity ended (R)

Clarity

- 8. I knew what I had to do to complete the activity
- 23. The goal of the activity was not clear (R)
- 32. The instructions were clear
- 35. I found using the application easy to learn
- 34. I did not find it easy to get started (R)

Achievability

- 1. I felt that I could achieve the goal of the activity
- 9. I had all the things I required to complete the activity successfully
- 11. I had a fair chance of completing the activity successfully
- 20. I found the activity difficult (R)
- 25. I found the activity frustrating (R)
- 29. From the start I felt that I could successfully complete the activity
- 33. The activity was challenging

Control

- 2. I had lots of choices to make during the activity
- 3. The types of task were too limited (R)
- 5. It wasn't clear what I could and couldn't do
- 6. The activity was too complex (R)
- 14. The activity would not let me do what I wanted (R)
- 18. I could not tell what effect my actions had (R)
- 21. I had lots of potential options available to me
- 42. I could not always do what I wanted to do (R)

Immersion

- 7. I found the activity satisfying
- 13. I felt absorbed in the activity
- 19. I felt that time passed quickly
- 27. I worried about losing control (R)
- 30. I felt emotion during the activity
- 40. I felt excited during the activity
- 36. I felt self-conscious during the activity (R)

Interest

- 15. I had to concentrate hard on the activity
- 16. I knew early on how the activity was going to end (R)
- 17. I found the activity boring (R)
- 24. I was not interested in exploring all of the environment (R)
- 31. I did not enjoy the activity (R)
- 39. The activity was aesthetically pleasing

Purpose

- 10. The activity was pointless (R)
- 12. The feedback I was given was not useful (R)
- 22. I did not receive feedback in enough detail (R)
- 26. I was given feedback at appropriate times
- 38. It was not clear what I could learn (R)
- 41. The activity was worthwhile

Appendix 20: Correlation data from questionnaire

Note that where a question has the letter R in front of it, the scale has been reversed. Questions with a dagger (†) do not correlate with the group.

Challenge (motivation)

- Q4 I wanted to complete the activity
 Q28 I wanted to explore all the options available to me
 R37 I did not care how the activity ended

	Q4	Q28	R37
Q4	1.000	0.340(**)	0.486(**)
Q28		1.000	0.458(**)
R37			1.000

** Correlation is significant at the 0.01 level (1-tailed).

Challenge (clarity)

- Q8 I knew what I had to do to complete the activity
 R23 The goal of the activity was not clear
 Q32 The instructions were clear
 R34 I did not find it easy to get started
 † Q35 I found using the application easy to learn

	Q8	R23	Q32	R34	† Q35
Q8	1.000	0.488(**)	0.518(**)	0.446(**)	0.195(*)
R23		1.000	0.522(**)	0.472(**)	0.143
Q32			1.000	0.616(**)	0.537(**)
R34				1.000	0.467(**)
† Q35					1.000

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

Challenge (achievability)

- Q1 I felt that I could achieve the goal of the activity
 Q9 I had all the things I required to complete the activity successfully
 Q11 I had a fair chance of completing the activity successfully
 † R20 I found the activity difficult
 R25 I found the activity frustrating
 Q29 From the start I felt that I could successfully complete the activity
 † Q33 The activity was challenging

	Q1	Q9	Q11	† R20	R25	Q29	† Q33
Q1	1.000	0.563(**)	0.587(**)	-0.297(**)	0.514(**)	0.582(**)	0.130
Q9		1.000	0.601(**)	-0.110	0.500(**)	0.342(**)	0.097
Q11			1.000	-0.230(*)	0.498(**)	0.478(**)	-0.053
† R20				1.000	-0.335(**)	-0.312(**)	0.337(**)
R25					1.000	0.477(**)	0.175
Q29						1.000	0.006
† Q33							1.000

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

Control

- † Q2 I had lots of choices to make during the activity
 R3 The types of task were too limited
 R5 It wasn't clear what I could and couldn't do
 R6 The activity was too complex
 R14 The activity would not let me do what I wanted
 R18 I could not tell what effect my actions had
 † Q21 I had lots of potential options available to me
 R42 I could not always do what I wanted to do

	† Q2	R3	R5	R6	R14	R18	† Q21	R42
† Q2	1.000	0.215(*)	-0.035	-0.098	0.128	0.243(*)	0.623(**)	-0.088
R3		1.000	0.324(**)	0.217(*)	0.421(**)	0.301(**)	0.243(*)	0.253(**)
R5			1.000	0.561(**)	0.564(**)	0.349(**)	0.090	0.525(**)
R6				1.000	0.517(**)	0.281(**)	-0.033	0.444(**)
R14					1.000	0.324(**)	0.191(*)	0.607(**)
R18						1.000	0.193(*)	0.261(**)
† Q21							1.000	0.050
R42								1.000

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Immersion

- Q7 I found the activity satisfying
 Q13 I felt absorbed in the activity
 Q19 I felt that time passed quickly
 † R27 I worried about losing control
 † Q30 I felt emotion during the activity
 † R36 I felt self-conscious during the activity
 Q40 I felt excited during the activity

	Q7	Q13	Q19	† R27	† Q30	† R36	Q40
Q7	1.000	0.610(**)	0.572(**)	-0.074	0.217(*)	0.146	0.442(**)
Q13		1.000	0.652(**)	0.089	0.167	0.133	0.472(**)
Q19			1.000	-0.076	0.297(**)	0.115	0.518(**)
† R27				1.000	-0.279(**)	0.206(*)	-0.060
† Q30					1.000	-0.098	0.510(**)
† R36						1.000	-0.164
Q40							1.000

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

Interest

- † Q15 I had to concentrate hard on the activity
 † R16 I knew early on how the activity was going to end
 R17 I found the activity boring
 R24 I was not interested in exploring all of the environment
 R31 I did not enjoy the activity
 Q39 The activity was aesthetically pleasing

	† Q15	† R16	R17	R24	R31	Q39
† Q15	1.000	-0.010	0.171	0.142	0.063	0.080
† R16		1.000	-0.118	-0.145	0.003	-0.034
R17			1.000	0.432(**)	0.528(**)	0.277(**)
R24				1.000	0.555(**)	0.291(**)
R31					1.000	0.280(**)
Q39						1.000

** Correlation is significant at the 0.01 level (1-tailed).

Purpose

R10	The activity was pointless
R12	The feedback I was given was not useful
† R22	I did not receive feedback in enough detail
Q26	I was given feedback at appropriate times
R38	It was not clear what I could learn
Q41	The activity was worthwhile

	R10	R12	† R22	Q26	R38	Q41
R10	1.000	0.347(**)	0.220(*)	0.322(**)	0.480(**)	0.587(**)
R12		1.000	0.421(**)	0.240(*)	0.369(**)	0.332(**)
† R22			1.000	0.498(**)	0.366(**)	0.294(**)
Q26				1.000	0.285(**)	0.264(**)
R38					1.000	0.572(**)
Q41						1.000

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

Appendix 21: Analysis of discrimination powers

Note: starred questions are those selected for the final inventory.
NC means not correlated.

Question	Factor	DP
* I did not care how the activity ended	motivation	2.1875
* I wanted to complete the activity	motivation	1.875
I wanted to explore all the options available to me	motivation	1.125
* I did not find it easy to get started	clarity	1.625
* I knew what I had to do to complete the activity	clarity	1.5625
The goal of the activity was not clear	clarity	1.1875
The instructions were clear	clarity	1.125
I found using the application easy to learn (NC)	clarity	0.875
* I found the activity frustrating	achievability	2
* I felt that I could achieve the goal of the activity	achievability	1.9375
I had all the things I required to complete the activity successfully	achievability	1.75
From the start I felt that I could successfully complete the activity	achievability	1.375
I had a fair chance of completing the activity successfully	achievability	1.1875
The activity was challenging (NC)	achievability	1.125
I found the activity difficult (NC)	achievability	-0.125
* It wasn't clear what I could and couldn't do	control	2
* The activity would not let me do what I wanted	control	1.4375
* I could not tell what effect my actions had	control	1.4375
The activity was too complex	control	1.4375
I could not always do what I wanted to do	control	1.1875
The types of task were too limited	control	0.8125
I had lots of potential options available to me (NC)	control	0.1875
I had lots of choices to make during the activity (NC)	control	0
* The activity was pointless	purpose	2.1875
* It was not clear what I could learn	purpose	2
The activity was worthwhile	purpose	1.8125
I was given feedback at appropriate times	purpose	1.375
I did not receive feedback in enough detail (NC)	purpose	1.3125
* The feedback I was given was not useful	purpose	1.25

Question	Factor	DP
* I did not enjoy the activity	interest	2.375
* I was not interested in exploring all of the environment	interest	1.9375
* I found the activity boring	interest	1.625
The activity was aesthetically pleasing	interest	1.0625
I had to concentrate hard on the activity (NC)	interest	0.8125
I knew early on how the activity was going to end (NC)	interest	-0.625
* I found the activity satisfying	immersion	2.1875
* I felt absorbed in the activity	immersion	2.125
* I felt that time passed quickly	immersion	1.6875
I felt excited during the activity	immersion	1.4375
I felt emotion during the activity (NC)	immersion	1.0625
I felt self-conscious during the activity (NC)	immersion	0.6875
I worried about losing control (NC)	immersion	-0.25

The final question selected in the purpose factor ('The feedback I was given was not useful') is not that with the highest discrimination power but was selected because it was less specific than the other question that related to feedback that had a slightly higher DP. The question 'The activity was worthwhile' was not included as it was considered to be exactly opposite to 'The activity was pointless'.

Appendix 22: Engagement questionnaire

Thinking about the activity you have just done, please indicate the level to which you agree with the following statements:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I wanted to complete the activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found the activity frustrating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I could achieve the goal of the activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I knew what I had to do to complete the activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found the activity boring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It wasn't clear what I could and couldn't do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was clear what I could learn from the activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt absorbed in the activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The activity was pointless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was not interested in exploring the options available	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did not care how the activity ended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that time passed quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found the activity satisfying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The activity would not let me do what I wanted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could not tell what effect my actions had	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did not enjoy the activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feedback I was given was useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it easy to get started	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Questions as they relate to engagement factors

Question	Factor
I wanted to complete the activity	Challenge (motivation)
I found the activity frustrating	Challenge (achievability)
I felt that I could achieve the goal of the activity	Challenge (achievability)
I knew what I had to do to complete the activity	Challenge (clarity)
I found the activity boring	Interest
It wasn't clear what I could and couldn't do	Control
It was clear what I could learn from the activity	Purpose
I felt absorbed in the activity	Immersion
The activity was pointless	Purpose
I was not interested in exploring the options available	Interest
I did not care how the activity ended	Challenge (motivation)
I felt that time passed quickly	Immersion
I found the activity satisfying	Immersion
The activity would not let me do what I wanted	Control
I could not tell what effect my actions had	Control
I did not enjoy the activity	Interest
Feedback I was given was useful	Purpose
I found it easy to get started	Challenge (clarity)

Appendix 23: Time Capsule learning questionnaire

Please take a few moments to complete this questionnaire on the Time Capsule Exercise. Indicate whether, after undertaking the exercise, you agree or disagree with the following statements

	Disagree	Agree
I understand how to make good decisions as part of a group.	<input type="radio"/>	<input type="radio"/>
I am more aware of what makes communication effective.	<input type="radio"/>	<input type="radio"/>
Constructive controversy is a good way to make decisions.	<input type="radio"/>	<input type="radio"/>
I understand what makes a group effective.	<input type="radio"/>	<input type="radio"/>
I will be better able to communicate with others in the future.	<input type="radio"/>	<input type="radio"/>
Group reflection is important for effective groups.	<input type="radio"/>	<input type="radio"/>
I will be better able to contribute to group decision-making in the future.	<input type="radio"/>	<input type="radio"/>
I appreciate the benefits of collaborating with others.	<input type="radio"/>	<input type="radio"/>
I can now contribute better to make group work more effective.	<input type="radio"/>	<input type="radio"/>
I enjoyed the exercise.	<input type="radio"/>	<input type="radio"/>
I found the instructions straightforward.	<input type="radio"/>	<input type="radio"/>

Any other comments?

Thank you for completing this questionnaire.

Appendix 24: Transcript of Time Capsule

Hilary: Hello there i am Professor Hilary Dustbuster
Felix: Hello all, I'm Felix Grubb
Hilary: who am i talking to
Felix: I'm the owner of the best chain of butchers in town
Catherine: Hi i am Dr Catherine Makewell
Hilary: I am in love with badgers
Hilary: and everythign to do with them
Felix: I am proud of my prize-winning sausages
Hilary: i am very big for my boots
Hilary: and like all things poetic and antiqueish
Catherine: i am a strong advocate of natural foods and helathy eating
Hilary: Right have you all been told that we need to pick some items to put in a capsule
Felix: Yes do you have any suggestions?
Hilary: well why dont you just let me pick
Hilary: who picked that
Felix: I think we're jumping the gun a wee bit here- why the record? Any reason?
Hilary: catherine your a bit on the quiet side are you not
Hilary: oh god thats my record
Hilary: no way
Catherine: yes i ve jsut understood how to see the different items
Felix: Of course, I think my prize-winning sausages should go in
Hilary: this is supposed to be a time capsule with things that people would like to see
Felix: They are, despite vicious rumours to the contrary, the finest sausages you'll ever taste
Hilary: we have a couple of options
Catherine: why not selecte 3 each items
Hilary: we can either pick 2 personal objects
Hilary: each
Hilary: or 6 that are related to the area, my option of course
Hilary: heritage is important
Hilary: and badgers
Catherine: ok so we pick 2 each at the moment
Felix: I have a few ideas as to what should go in, so let's see what two we can come up with
Hilary: pick 2 each the and see what we come up with
Felix: I like the look of the signed photo of sporting legend Wilbur Grace, and also either the Doomsday book or the yearbooks
Felix: Local heritage and all that
Hilary: why dont you pick two options
Hilary: please
Catherine: be careful we are over 1000
Hilary: we are over budget someone will have to change
Felix: It seems the bones and the poetry are most expensive
Catherine: at the moment i ve chosen jsut one and it cost £50
Hilary: but very important
Hilary: who picked three come one admit it
Felix: I've only picked two, I don't know who picked the record- my lot comes to £2
Felix: £200 rather
Hilary: well if we can still change something that would be good
Hilary: but the bones are rather famous you know
Hilary: and great aunty augustus we have to keep her memory going
Hilary: with the poetry and all that
Catherine: is it the poetry book very important?

Felix: I am of the opinion that things like bones and historical artifacts should be in museums, but that's just my view
Catherine: yes
Hilary: ah mmmmmmm er good point
Hilary: beer should be in pubs
Hilary: shall we agree to move them out
Catherine: but beer is only £50
Hilary: and wont last in the time capsule
Felix: True
Hilary: will it?????????????
Catherine: ok we camn remove it
Hilary: i have chosen the map
Felix: I think things like the yearbooks would last a while and be interesting to read 1000 years down the line
Felix: Yes I like the map actually
Catherine: like the newspaper
Hilary: ah we seem to have reached the 6 items and the money
Hilary: would do u two dudes think
Hilary: about tat
Hilary: horrible contraptions these computers
Hilary: give me a badger any day
Felix: Er, have a few misgivings about the film
Hilary: uhuh
Catherine: ca we remove the signed photo?
Hilary: remove away
Felix: It features some less than complimentary views about my fine business
Felix: I rather like local sports myself, but fair enough
Hilary: ah and if they dont have the projector either
Felix: Oh, woops, good point
Catherine: yep
Catherine: like the rocks what is the point?
Hilary: what about my book
Hilary: fine sample of good reading
Hilary: its all about badgers
Felix: I'm indifferent about the rocks. Anyone thought about the culinary magazine?
Felix: It features an article on fine local sausages
Catherine: ok for the history book
Hilary: but not enough money
Hilary: now
Felix: D'oh, the history book has taken us to the limit
Hilary: yes
Catherine: we can stay like that we reach teh £1000
Hilary: but only 5 items selected
Hilary: we need one more
Catherine: is it an obligation?
Hilary: yes
Felix: We need another thing. Why don't we replace rocks with something also worth £50?
Felix: rocks are cheap and also boring
Catherine: yes the beer
Hilary: no the fudge
Felix: How about the magazine which will not smell bad when it goes off
Felix: But is also about food
Hilary: compared to what
Felix: Rotting fudge or something
Hilary: mmmmmmm
Catherine: ok for me go for th emagazine
Felix: Unless fudge lasts for ages with all those preservatives

Hilary: still one down and at our limit
Hilary: something will have to go
Hilary: the map
Hilary: cos my book is all about me
Felix: The map is quite dear, true
Hilary: what about the doomsday book
Felix: yes that is a fine example of our local kiddies' talent
Catherine: if we remove the map we can select the beer the fudge and the dsausage
Felix: I am a strong believer in supporting local schools
Hilary: but that will be too many then
Hilary: what is your doctorate in, surely not mathematic
Felix: Erm, let's just take the map off and see what happens
Hilary: so are we deciding on the doomsday, we dont hae to spend all the money
Hilary: space for one more if you like
Felix: I'll root for the doomsday book. Do we want a foody thing?
Hilary: badgers are nice
Felix: sausages are also nice
Hilary: badgers are rare and sacred
Hilary: there wont be any by the time the capsule is opened
Felix: Um, the photo, the mayor looks sort of off-colour, this is not a good way to remember him surely
Hilary: would a badger be a nice thing to see
Hilary: the whiffling spoon is full of heritage
Hilary: who picked the photo
Hilary: i want to know
Felix: It was not me, I don't like the look of the mayor in that photo
Hilary: catherine
Felix: He looks somewhat nauseous for some unknown reason
Hilary: why the photo
Catherine: with the picture they will see the happy crowds
Felix: That day was not a happy day for Grubbs Plc
Hilary: but the badger they get to touch and see
Hilary: badger
Hilary: badger
Hilary: badger
Hilary: stuffed badger even
Catherine: ok go for it
Felix: I like the badger
Felix: It is furry
Hilary: are we allowed to be under our budget
Felix: And won't smell
Catherine: yes
Felix: I think so
Hilary: shall we agree
Hilary: we seem to have all our items
Catherine: i agree
Felix: I think it looks good from here
Hilary: then press the button
Felix: Righto

Appendix 25: Transcript of Pharaoh's Tomb

Jane: Hello!
Pete: Hi!!!
Mike: hi
Jane: Nice to meet you!
Mike: nice to meet u 2
Jane: Do you have anything on you? I think I have the ankh
Pete: a wipe
Mike: i have bucket
Jane: Useful if anyone has an accident
Pete: whats that in the first room?
Pete: top left?
Jane: I don't know, lets go closer and look
Pete: banboo
Pete: maybe?
Jane: Did you just put down a whip in its place?
Pete: yer
Jane: I see!
Pete: then put it back
Mike: what will put fire out? is my hint
Pete: water!!!
Jane: Did you use the hint button?
Mike: yes
Mike: i have a key too
Pete: got a bucket full of water
Pete: follow me
Jane: You loose points for taking hints (I am far too competative)
Pete: found a chest
Mike: oops
Pete: think we need a key???
Mike: i have a key
Jane: There is a locked door here, do you want to try to open it with your key?
Mike: how
Pete: go to the far east room with the key
Pete: where are you?
Jane: I am the blue ball on the map
Pete: where is Mike??
Jane: Have you gone wondering?
Mike: i am green triangle
Pete: Mike can you go east?
Mike: how
Pete: is there a door?
Jane: It's okay, you have left your key! I'll open the door
Mike: good
Jane: Did someone else just pick it up?
Pete: i unlocked the chest!!!
Pete: now have a yellow key
Jane: What did you find, and where are you both?
Mike: good- i have a whip now and i think wood
Jane: Pete, do you want to try the yellow key in the door?
Pete: you can now get in the green room
Jane: What is in there?
Pete: a big vase
Pete: another locked door
Jane: Any scroll?
Pete: there is another room as well
Jane: I have found bucket & tap anyone got any ideas?
Mike: i have found an ankh

Pete: and something on a shelve
Jane: I just put that down
Pete: who has the whip?
Jane: Just found a snake
Mike: just found a chest with key - my co-ords are (4,1)
Pete: what the blue thing is in the snake room?
Pete: and in the room on the far wall?
Jane: I have found the whip, do you want me to get the thing off the shelf
Pete: yer try it
Pete: did it work?
Pete: just made a flute
Jane: Can't find it!
Pete: snake charm!!!
Jane: Good plan
Mike: i am in the scarab room
You have whipped a piece of the scarab off the shelf.
Pete: have the blue thing from the room
Pete: have no idea what it is???
Pete: i will put it down
Mike: need three parts to access the next room
Pete: good call
Jane: Apparently its a piece of the scarab, where did you find the scarab room?
Pete: i see now!!!
Pete: the beetle on the wall
Pete: we need the head bit
Jane: I have put a piece in
Jane: Looks like we need another key?
Jane: I'll go get the ince from the chest
Pete: try the first blue one maybe??
Pete: no luck
Pete: that vase has something i know it
Jane: Yellow key dosn't work
Jane: Where is the vase?
Pete: in the big room
Jane: found it!
Jane: we could fill it with water, we havn't used the bucket yet
Jane: I see someone has
Pete: already there lol!!!
Mike: i have found a musical bat!!
Jane: Freaky!
Pete: ladies first
Jane: So the floor is wet, where does that get us?
Pete: through the door
Jane: What else is there?
Jane: Oh yes, should have moved my view!
Mike: a chart
Jane: Who fancies a trail then?
Pete: whats the chart mean??
Jane: Trial I mean
Jane: Read the scroll
Mike: it has in heiros 1,2,3,4 leg arm eye etc
Mike: morning afternoon evening night
Jane: Is it the key to the riddle in the chamber of riddles?
Pete: its like the crystal maze!!!
Mike: person lion bird snake
Mike: leg arm eye mouth
Pete: good call writing the chart stuff
Jane: I am standing by the door of the chamber of riddles, shall we do this challenge first?

Pete: we made need to recall it
Mike: what should we do with the chart
Pete: who wants what task then?
Jane: I think we should do one all together
Jane: Group work and all that
Pete: i think you can only do then by yourself
Pete: the others stay outside and help?
Jane: If you read the scroll for the chamber of riddles it says you will need your fellows to unlock the puzzle
Pete: read the scroll to the far north west
Jane: That sounds right, Pete, do you want to go in?
Pete: we better hurry up
Pete: ok i will go
Jane: Grand, let us know what you find
Pete: i have a riddle
Jane: sweet
Pete: its from the chart on the wall
Jane: okay, I have the chart in front of me
Pete: the first is one of the bottom numbers
Pete: like a backwards 3
Mike: yep
Jane: four
Pete: or a E lol
Pete: the next is a backwards 7
Jane: two
Pete: 3,2
Pete: the a larger backwards seven
Jane: three
Pete: 3,2,3
Jane: the three has two curves to the top line
Pete: then there are loads of feet?
Jane: leg
Pete: what the one with one curve
Mike: yes legs three of them
Pete: 4,2,3
Jane: If the larger backwards seven has two curves on the top stroke, then it is the symbol for three
Pete: then loads of sun rises
Pete: one in the west
Jane: one in west = evening
Pete: one slightly west of the top
Jane: one slightly west of the top = afternoon
Pete: 4 leg evening!!!!
Pete: 2, leg afternoon
Jane: Four legs in the evening
Jane: two legs in the afternoon
Pete: next sun is in the east
Jane: sun is in the east = morning
Pete: three leg morning!!!
Jane: Does this ring any bells with you?
Mike: no
Pete: not sure i have to select a object on the wall
Pete: there is a lion
Pete: old man
Pete: chick
Pete: some of those numbers
Jane: That must be the answer to the riddle:
Pete: what?
Pete: a moon
Jane: Four legs in the evening, two legs in the afternoon, three leg in the morning

Pete: a bent arm
Pete: a foot
Pete: a eye symbol
Mike: its man
Jane: I think thats it!
Pete: bingo!!!!
Pete: well done
Jane: great, have you got a bit of the scarab?
Mike: well done everyone
Pete: how did you get that?
Jane: Well done
Pete: that cat on the wall
Pete: now has a eye
Pete: Mike do you want the next room?
Jane: So do we need to find more jewels
Mike: yes
Pete: think so
Jane: lets read the next scroll
Pete: go for it
Pete: Mike choose a room
Pete: one of the south one
Mike: the south one right
Pete: yer either of them
Jane: Labyrinth Chamber
Mike: Labyrinth chamber
Pete: they have locks???
Jane: Has one of you gone in?
Mike: must rely on teammates to navigate
Mike: where am i
Pete: ok
Mike: dark very
Jane: we can watch you on the map
Pete: where are you?
Mike: i don't know
Pete: i cant see you on the map
Pete: can you see yourself?
Mike: no
Jane: I can see myself and Pete
Mike: its completely dark here
Pete: the room makes the map useless
Jane: I see you
Mike: have found jewel
Pete: bring the jewel to the cat
Jane: can you see to get out now?
Mike: no
Jane: go north twice
Pete: ok go east
Pete: twice
Pete: east
Mike: and now
Pete: once you have gone east twice go north three times
Pete: then east again
Pete: then north once
Jane: are you looking at the compass at the top of the screen?
Mike: no
Pete: lol
Pete: may help lol!!!
Mike: can't get out
Jane: which way are you faceing at the mo?
Pete: you aint moving
Mike: south

Pete: face east
Pete: then move twice forward
Pete: tahts it one more
Pete: now north twivce
Pete: now east once
Pete: then north once
Mike: functionality not good
Pete: try to go east
Pete: once
Jane: you are very close, one room away from us
Mike: so close yet so far
Pete: no wrong way
Jane: you are going away now
Pete: turn north
Pete: then move twice
Mike: can't move well feel somewhat wounded
Pete: lol
Pete: crawl!!!
Pete: now east
Pete: once
Jane: move it, just seven minutes to go!
Mike: functionality gone
Pete: turn east
Pete: then move forward
Jane: where you banging your head against a wall?
Pete: bingo!!!
Jane: well done!
Pete: good to see ya
Mike: 5 minutes
Jane: better focus!
Jane: can you put the jewl in
Pete: nice
Mike: done
Pete: Jane your turn
Jane: human sacrifice!
Pete: what do you see??
Jane: lovked door
Jane: step
Pete: anything else
Jane: I can push the stp down
Pete: hey i am in the room to
Mike: me too
Jane: can someone stand on the step and seee if the door opens?
Pete: who has the ankh?
Jane: are you watching the door
Jane: not me
Jane: does anyone have it?
Mike: standing on step
Pete: found it
Jane: Pete, where are you? are you getting the ankh?
Jane: coolio
Pete has left the game
Jane: you sod
Pete: i left!!!
Pete: cya
Mike: how could u
Jane: the air is getting thin in here.....
Pete: run!!!!
Mike: not playing with him again
Jane: Mike, if I stand on the step can you go into the room?
Pete: hurry up!!!

Appendix 26: Engagement questionnaire results

Napier pilot

		Engagement score		
	<i>n</i>	Min	Mean	Max
Pharaoh's Tomb	8	43	69.5	86
Time Capsule	7	56	67.9	82

HK pilot

		Engagement score		
	<i>n</i>	Min	Mean	Max
Pharaoh's Tomb	12	55	64.1	75
Time Capsule	7	58	65.0	78

Napier trial

		Engagement score		
	<i>n</i>	Min	Mean	Max
Pharaoh's Tomb	42	47	65.6	90
Time Capsule	36	44	66.4	90

Appendix 27: Engagement factor correlations

Challenge: motivation

Q1: I wanted to complete the activity

Q11: I did not care how the activity ended (reversed)

	Q1	Q11
Q1	1.000	0.423(**)
Q11		1.000

** Correlation is significant at the 0.01 level (1-tailed).

Challenge: clarity

Q4: I knew what I had to do to complete the activity

Q18: I found it easy to get started

	Q4	Q18
Q4	1.000	0.285(**)
Q18		1.000

** Correlation is significant at the 0.01 level (1-tailed).

Challenge: achievability

Q2: I found the activity frustrating (reversed)

Q3: I felt I could achieve the goal of the activity

	Q2	Q3
Q2	1.000	0.306(**)
Q3		1.000

** Correlation is significant at the 0.01 level (1-tailed).

Control

Q6: It wasn't clear what I could and couldn't do (reversed)

Q14: The activity would not let me do what I wanted (reversed)

Q15: I could not tell what effect my actions had (reversed)

	Q6	Q14	Q15
Q6	1.000	0.359(**)	0.346(**)
Q14		1.000	0.351(**)
Q15			1.000

** Correlation is significant at the 0.01 level (1-tailed).

Interest

Q5: I found the activity boring (reversed)

Q10: I was not interested in exploring the options available (reversed)

Q16: I did not enjoy the activity (reversed)

	Q5	Q10	Q16
Q5	1.000	0.430(**)	0.522(**)
Q10		1.000	0.406(**)
Q16			1.000

** Correlation is significant at the 0.01 level (1-tailed).

Immersion

Q8: I felt absorbed in the activity

Q12: I felt that time passed quickly

Q13: I found the activity satisfying

	Q8	Q12	Q13
Q8	1.000	0.151(*)	0.377(**)
Q12			0.337(**)
Q13			1.000

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Purpose

Q7: It was clear what I could learn from the activity

Q9: The activity was pointless (reversed)

Q17: Feedback I was given was useful

	Q7	Q9	Q17
Q7	1.000	0.328(**)	0.301(**)
Q9		1.000	0.327(**)
Q17			1.000

** Correlation is significant at the 0.01 level (1-tailed).