

Technology Supported Learning within Art and Design: The acquisition of practical skills, with specific reference to undergraduate introductory sound recording and interview techniques.

James Andrew Davis MA, BA (Hons)

A thesis and supporting creative work submitted in partial fulfilment of the requirements of the University of Wolverhampton for the degree of Doctor of Philosophy.

Date: 09/09/08

This work or any part thereof has not previously been presented in any form to the University or to any other body whether for the purposes of assessment, publication or for any other purpose (unless otherwise indicated). Save for any express acknowledgments, references and/or bibliographies cited in the work, I confirm that the intellectual content of the work is the result of my own efforts and of no other person.

The right of James Andrew Davis to be identified as author of this work is asserted in accordance with ss.77 and 78 of the Copyright, Designs and Patents Act 1988. At this date copyright is owned by the author.

Signature.....

Date.....

Abstract

While many Higher Education subject areas have embraced technology-supported-learning (TSL), its uptake has been noticeably slower in the practicum of the art and design subject area. As such our understanding of the use of TSL in this practicum is under-developed. This multi- and inter-disciplinary practice-based research project is a case study, within this under-developed area, based around the question: "Can TSL aid the acquisition and development of practical skills associated with sound recording a location-based interview, introduced (as part of studio-based practice) during a three-hour class to level 1 undergraduate art and design students?" In addressing this research question I argue that the design and evaluation of TSL requires a holistic approach, grounded in an understanding of the audience, subject matter and learning context / environment, requiring a comprehensive consideration of user experience design (UXD), where theory informs rather than leads pedagogy/practice.

Taking a grounded approach, an analysis of existing needs was first undertaken within the learning environment; practitioners, and other UK providers of SRIT skills were consulted; a number of pre-existing technology-based practical skills-focused artefacts were reviewed and theories, models and principles were drawn upon across a number of associated cognate fields.

Adopting a post-theoretical perspective and action research principles, an artefact called "RecordingCoach" was designed, realised, utilised and evaluated. RecordingCoach enables its users to observe sound recording equipment being setup; set up a virtual sound kit themselves as well as undertake both assisted and independent interviews with two virtual interviewees. RecordingCoach records the independent virtual interviews in real time and saves them to the host computer hard drive, capturing microphone handling, responses to situational/environmental sound and verbal audio exchanges.

The evaluation of RecordingCoach took place over a one-year period with the participation of 108 students. Attitudes towards the artefact, patterns of learning activity, behaviour and assignment performance were scrutinised and non-assessed performance indicators were referred to. The resulting findings are very positive suggesting that TSL can be effective within the practicum of the art and design subject area.

Table of contents

Abstract.....	2
Table of contents.....	3
Acknowledgements.....	12
Chapter 1 - Introduction.....	13
Background.....	13
UK national context	13
Regional context – University of Wolverhampton	14
Technology supported learning environment.....	14
Art and design subject	15
The underdevelopment of TSL in art and design.....	15
Idiosyncrasies of art and design education.....	15
Virtual Learning Environment (VLE) and art and design.....	17
Research question, approach, arguments and project framing	20
Main research question	20
Approach	20
Arguments	20
Secondary complementary questions.....	21
The cognate framing of this multi- and inter-disciplinary practice-based study.....	21
Bicycle wheel structure.....	22
Chapter 2 - Literature review.....	23
Art and design pedagogy – educational theory.....	24
Learning by doing.....	25
Reflection and the practicum	26
Situated learning	28
Technology supported learning (TSL).....	30
TSL – a landscape of research and practice	30
VLEs, learning objects and toolkits	32
VLE.....	32
Learning objects	33
Toolkits	35
Borrowing theories – part 1 (learning and teaching)	36
An influential TSL pedagogic model.....	38
Borrowing theories – part 2 (user experience design (UXD))	39
UXD – an interaction design (TSL - product) perspective.....	40
A common goal – ‘usability’	41
A UXD TSL model	42
UXD and TSL – examples from a wider learning and teaching perspective	45
Learning design and design for learning.....	45

Blended learning – learning context	46
UXD and TSL design – a holistic perspective	47
More than pedagogy – concern for UXD in games and other domains ...	49
The design and realisation of TSL – a multi- and inter-disciplinary endeavour	51
The starting point – a grounded approach	53
Artefact review – the role of the critique.....	56
Emerging within the practice-based grounded approach.....	59
Simulations.....	59
Situation awareness and SRIT – ‘dynamic skills’.....	62
Modality	63
Modal density	63
Multi-modal interaction.....	64
Clark and Mayer (2008) Modality Principle – text and images.....	64
Personalisation Principles	65
Conversational v formal style.....	65
Make the author visible.....	65
Reflection on this review	66
Scope of the review.....	66
A trilogy of perspectives and roles	67
Project framing and practice model.....	68
Chapter 3 - Needs and task analysis	70
An outline of DM1006 and the research focus within the module	70
Delivery of DM1006.....	70
DM1006 overall module aim and learning outcomes.....	70
Assignment tasks and assessment methods.....	71
Use of TSL in the module.....	72
A focus on teaching week three	72
DM1006 learning and teaching activities weeks 1 to 7	72
Week 1	72
Week 2	73
Week 3	73
Week 4	75
Week 5	76
Week 6	76
Week 7	76
Independent study (homework)	76
Teaching concerns within DM1006	76
A profile of DM1006 student cohort	77
Prior experience	77
Student expectation.....	78
Preparation, approach and resource usage.....	81

Preparation	82
Learning experience	84
Self-evaluation	85
Learning issues and verifying observations and assumptions	85
Authentic activity	87
An issue with practice.....	88
Reflective practice	89
Task analysis and SRIT skills	90
SA and a goal-directed task analysis	90
Undergraduate study of SRIT elsewhere in the UK	91
Profile of student cohort	93
Study environment	94
Methods and resources employed	94
Assessment activity and practice.....	95
Priority within study	95
SRIT elsewhere in the UK – a summary	96
A brief overview of published SMEs' views on SRIT	96
Key texts – indicative reading	96
Interviewing	97
Audio recording	97
The reflections of a SRIT practitioner – subject matter expert.....	98
The interviewee	98
The interview	98
Harper on sound recording	99
Harper on interviewing.....	99
Harper on confidence, learning and development	99
SRIT and practical skills.....	99
Strengths, weaknesses and needs.....	101
Chapter 4 - Learning technology opportunities.....	104
Reflecting on the needs and characteristics of the subject matter (SRIT) and students	104
Ascertaining the type of TSL artefact.....	105
Situation awareness, simulators – facilitating practice.....	105
Instructor-supported or stand-alone simulation models	106
A mix of dynamic and linear virtual product and branching stories simulation model.....	107
Unpredictability	107
Where and how the simulator (artefact) would be used.....	108
The scale and scope of the simulator – (SRIT content).....	109
Learning activities.....	109
TSL artefact (simulator) learning and teaching aims	110
TSL artefact (simulator) design objectives.....	111

Chapter 4 summary	111
Chapter 5 - Artefact design and development	113
Developmental model	113
User participation	113
Focus and usability groups	114
RecordingCoach design and production.....	115
Strategy	115
Distribution and delivery	115
Scope	116
A preliminary functionality specification	116
Sound	117
Margaret Weatherby, unpredictability, questions and answers.....	118
Structure	121
Main and submenus	121
A problem with scale and the practice submenu solution	122
User performance feedback	123
Content guidance and help using RecordingCoach.....	124
Microphone, mouse, keyboard and input device zones.....	126
Promoting preparation, open-eye.co.uk and Margaret's challenge.....	128
Margaret's secret, the Easter eggs and goals	129
The 60 second timer	132
The price of collaboration	132
Skeleton	133
Representing the interviewer	133
Margaret – avatar or human? Representing the interviewees	133
Technical performance	135
Instructions and the legacy of user interaction (aiding reflection)	136
Repetition and skipping	138
Surface	138
La vie en rose	138
RecordingCoach – walkthrough.....	139
Chapter 5 summary	139
Drawing upon prior experience	139
Compromises	140
Resources and cost.....	141
Chapter 6 - Research methodology	143
Research approach.....	143
Further consideration of research methods	144
Outstanding research questions	144
Simulation evaluation issues	144
Measuring situation awareness	145
Evaluation matrix	146
Establishing some evaluatory questions.....	146

Data collection methods	147
RecordingCoach field trial.....	148
Introducing RecordingCoach	148
Collecting the data.....	149
Administered surveys	149
Discussion groups	150
Activity log	150
Discreet observation.....	150
Assignment assessment.....	151
Data processing.....	151
Validity	151
Chapter 7 - Field trial evaluation – data analysis.....	152
Scale and format of evaluation	152
Where to start?.....	152
How was RecordingCoach received?	153
Ease of use	153
Field trial RecordingCoach introductory session observations	153
Stability.....	154
Helpfulness.....	154
Enjoyment	155
Value and relevance.....	156
Usage	158
How does the learning experience differ?.....	159
The class-based activities as a preparation for the assignment and sound kit availability	159
Observing collaboration and peripheral participation.....	160
Reflection in the classroom	160
What perceptual and behavioural changes occur?.....	160
Sound kit bookings and real interviews.....	160
Preparation.....	162
Practice	163
Monitoring.....	164
Sound kit fault reporting.....	164
How is assignment performance affected?.....	165
Attainment	165
Enhancing performance	166
Prepares students to undertake the assignment	166
Helps students to have a better understanding of recording issues	166
Helps students achieve better grades.....	166
What factors in the design of RecordingCoach impeded or extended SRIT?.....	168
Worst aspects of RecordingCoach.....	169

Programme performance.....	169
Limitation of content.....	169
Repetition of activity.....	169
Margaret – is the worst	170
Design	170
Best aspects of RecordingCoach.....	171
Opportunity to practice.....	171
Informative.....	171
Design (technical appreciation)	171
Margaret – is the best	171
Challenge	172
Reflecting on the evaluation data.....	172
Summary notes.....	173
Chapter 8 - Project reflection, original contribution and further	
research	174
Reflecting on the project – some lessons learned	174
A practice-based approach	174
RecordingCoach – design.....	175
Design framework.....	175
Design for repeated use (practice).....	175
Design for reuse	176
The project goals.....	178
Original contribution	179
Addressing the underdevelopment of TSL in art and design.....	179
TSL to support SRIT skills.....	179
UXD as a holistic concern	180
Linking SA to SRIT	181
Suggestions for future research.....	181
An in-depth study of the relationship between SA and SRIT.....	182
Mapping UXD as a concern across TSL research and practice	182
Garrett's five planes as a team-based developmental model	183
Expanding the field-trial evaluation	183
In support of future projects.....	183
RecordingCoach – Tacit Knowledge.....	184
Final remarks	185
Appendices	186
Appendix 1 - Module Assignment Brief and Assessment Criteria.....	187
Appendix 1a - Element I and II Assignment Brief	187
Appendix 1b - Element I assessment criteria.....	189
Appendix 1c - Element II assessment criteria.....	190
Appendix 1d - Module guide	191
Appendix 2 - Module learning and teaching activities.....	193

Appendix 2a - Week three taught session - group devised role-play questions	193
Appendix 2b - Examples of assignment 1 student work (located on the appendices CD-ROM)	194
Appendix 3 - Module cohort survey	196
Appendix 3a - Cohort profile, prior experience and module expectations	196
Appendix 3b - Evaluation, reflection practice and resources	198
Appendix 4 - Providers' survey	200
Appendix 5 - Field trial second survey (week 7)	202
Appendix 6 - Semi-structured discussion group, primary questions	206
Appendix 7 - RecordingCoach activity log	207
Glossary of abbreviations	208
Glossary of terms.....	209
Table of figures.....	210
Bibliography	215
Supporting creative work	248
Element 1 - TSL artefact outline project cycle and skills audit.....	249
Element 2 - Artefact Reviews: Seeing Drawing / Artist! / Easy Drums / Flight Simulation - Microsoft Combat Flight Simulator (WWII Europe Series).....	257
Scope and focus of the review.....	257
Drawing and learning (Seeing Drawing)	258
Drawing as reflection.....	260
Introduction - using activities to illustrate a point of view	261
Facilitating reflection and collaborative learning within 'Truth'	263
Issues with 'Truth'	265
Dispelling preconceptions within 'Eye'	267
Emulation.....	268
Formative evaluation	274
Artist! PC CD-ROM	276
Where to start? Supporting the beginner	276
Practice exercises	278
User preferences and presentation flexibility	279
Facilitating comparison.....	281
Artist! review summary	282
Easy Drums	283
Organising content	283
Issues with content delivery	284
Technical issues	284

Text and narration.....	284
Tutor role and representation	285
Interaction and input mechanisms	285
Easy Drums review summary	287
Flight Simulation - Microsoft Combat Flight Simulator (WWII Europe Series).....	287
Why Combat Flight Simulator?	287
Flexible user-defined engagement.....	288
Realism and complexity of interaction.....	290
Interface settings	291
Behaviour settings	294
Application performance settings.....	295
Microsoft Combat Flight Simulator (WWII Europe Series) Review Summary	296
Element 3 - Project artefact (Recording Coach) preliminary functionality specification	297
Element 4a - RecordingCoach flow chart v.1.....	309
Element 4b - RecordingCoach flow chart v.2.....	310
Element 5 - RecordingCoach scripts	311
Element 6 - User testing group June trials testing plan	368
Element 7 - RecordingCoach walkthrough	376
Technical note	376
Start and loading and verification.....	376
The main menu and introduction.....	377
The control panel.....	378
The practice sub-menu and sound kit demo.....	379
Sound kit set-up	381
The assisted assignment and the 60 second timer.....	385
Take an assignment and the introductory sequence	387
Question selection	388
The tie mic and introduction to interview controls	389
The Elmore Dock Café and sound kit set-up	390
Margaret arrives and holding the microphone	391
Reordering and asking questions plus Margaret's research challenge..	392
Follow-up questions.....	394
Mic distortion and background noise	397
Interview debrief	399
Mood state and the different paths	400
Retrieving your recording.....	400
Element 8 - RecordingCoach - Installation and system requirements .	401
How to install and run.....	401
System requirements	402

Disclaimer..... 402
Element 9 - RecordingCoach CD-ROM.....403

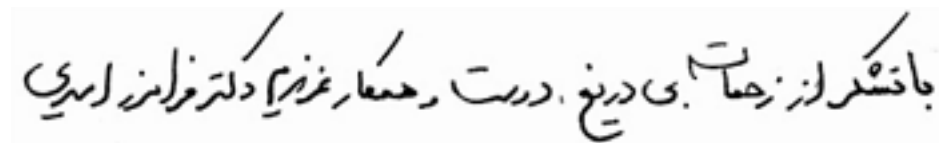
Acknowledgements

As an independent project with very little institutional support for much of its existence, this research was truly only made possible through the love, generosity and support of some really special folk. Some I have never met, such as the guys at Mediaclick.com and Tabuleiro.com who both generously gave copies of their audio “Xtras” to the project free of charge. I’d like to thank the team at the Wolverhampton Science Park and in particular Andrew Gilson for the safe haven made available to me throughout the project. I’d like to thank the students past and present for their interest, support and participation. Friends and family were unrelenting in their patience and encouragement and I tip my hat to you all. Alison and JC much love and thanks for letting me do this.

Margaret Weatherby aka Louise Weldon, you really did the business.

Thanks to Professor Keith Cummings for our contemplative meetings and your insightful comments. Thanks also to colleagues who took the time to read and comment on the various drafts of this thesis.

There are some people you meet who really change your life. Dr. Faramarz Amiri you are one of those people. You gave me confidence, support and encouragement to both start and finish this and for that I will be eternally grateful. (But I am not going to run the course!)



با تشکر از زحمات بی دریغ، درست و همکار عزیزم دکتر فaramarz امیری

Finally I’d like to dedicate this work to my brother, Phillip Anthony Davis, may we meet again.

Chapter 1 - Introduction

In recent years, while the adoption of technology supported learning (TSL) has become increasingly prevalent across many of the subject areas in English universities, the uptake of the use of TSL in the art and design subject area has been slow. As such our understanding of the use of TSL within this subject area is underdeveloped (see 'The underdevelopment of TSL in art and design' on p.15 later in this chapter). Taking a post-theoretical perspective of knowledge and learning, and drawing upon action research principles, this multi and inter-disciplinary practice-based research project seeks, by developing a case study, to contribute to our understanding of the use TSL to support teaching and learning within the practicum that is studio-based practice in the undergraduate art and design subject area. In this project, specific focus is given to supporting the introduction and development of 'sound recording and interview technique' (SRIT) skills (studio-based practice) as it occurred in the latter part of a three hour class to level one undergraduate art and design students studying a module entitled 'DM1006 - Introduction to digital sound'.

This chapter describes the context in which this multi- and inter-disciplinary practice-based research project was initiated. Within this context, the main research question is described including a number of complementary secondary questions. Additionally this chapter presents the cognate framework for this study and sets out the arguments I will make for the approach this research project has taken.

Background

UK national context

In recent years English central government educational policies sought to broaden participation and expand training opportunities. The 1998 Green Paper (a consultation document) was circulated to 4000 institutions and organisations. The paper and its subsequent response entitled 'The Learning Age' proposed the expansion of higher and further education to accommodate additional provision for 500,000 people by 2002 (Department for Education and Employment 1999). In January 2002 the House of Commons issued two reports: 'Widening Participation in Higher Education in England' and 'Improving Student Achievement in English Higher Education' which documented the government's policy for the further expansion of education. One such policy was to: "Increase participation towards 50 per cent of those aged 18-30 by the end of the decade, while maintaining standards" (The Comptroller and Auditor General 2002a, p.1).

The education and training sectors in England rose to this challenge. The Quality Assurance Agency for Higher Education noted: “New approaches to learning and to the form of the learning environment have been developed, both in response to the agenda of mass higher education, and to developments in teaching, learning and assessment in HE” (Quality Assurance Agency for Higher Education 2002. p. 2).

Regional context – University of Wolverhampton

Responding to the need to widen participation, the University of Wolverhampton instigated a number of initiatives. One of these was the establishment of an Information and Communications Technology (ICT) Project in 1998. Its remit was to assess the value of using technology in support of student learning. The project’s findings in 1999 recommended that the University adopt technology supported learning and that all level 0 and level 1 modules (pre-undergraduate study and first year undergraduate study respectively) develop some form of engagement with technology by 2002. This initiative was entitled the Technology Supported Learning (TSL) Project.

Adoption of the project was further strengthened with the project’s inclusion in the University’s Learning and Teaching Strategy. Two of the key recommendations of the strategy were to establish a Centre for Learning and Teaching, and to exploit the advantages of using technology in support of student learning so as to increase economies in learning and teaching practices.

The then newly formed Centre for Learning and Teaching led the TSL project providing strategic direction and support. The development of learning material was devolved within the University to each of the Schools. Academic staff within these Schools, were in turn responsible for the creation of material suitable for a technology supported learning environment.

Technology supported learning environment

The University adopted its own proprietary virtual learning environment (VLE) known by the acronym ‘WOLF’ (Wolverhampton On-line Learning Framework) as its primary technology supported learning environment. An Internet-based environment, WOLF had been developed out of a previous University/European funded project and was viewed as providing the University with a technological advantage within the region.

The University must capitalise on its technological advantage in the region with strategic development of online learning for new constituencies of learners and improved learning materials for existing learners. (University of Wolverhampton 2000, p.2)

Art and design subject

This research project was undertaken within the context of the aforementioned developments inside the School of Art and Design at the University of Wolverhampton.

For clarity, the use of the term 'art and design' in this thesis refers to the established differentiation between art and design (A and D) and History of Art, Architecture and Design (HAAD) by the Quality Assurance Agency for Higher Education (2002, p.2) where art and design is considered practice/studio-based and HAAD less so.

The underdevelopment of TSL in art and design

At the start of this project an initial literature review revealed little work had been documented regarding the creation and use of TSL in the higher education art and design subject area. This is an observation shared by Souleles (2005) who suggested that e-learning in art and design was however not a neglected but rather underdeveloped area. Drew and Williams (2002), Goult (2004), Peacock and Andrews (2004), Social Informatics Research Unit (2005), Logan *et al.* (2007) all identified/reported the slow take-up of TSL by the art and design subject area.

Idiosyncrasies of art and design education

It is not the intention of this project to determine why TSL in art and design remains underdeveloped. However, it is helpful to have both an appreciation of the idiosyncrasies of learning and teaching in undergraduate art and design and an overview of other researchers' observations on this phenomenon.

Drew (2007) offered a general description of learning and teaching environment in art and design suggesting:

...learning to be an artist or designer requires much more than the acquisition of skills and knowledge. It is a transformative process of becoming a creative practitioner and belonging to a particular community of practice.Combined with new technologies and emerging creative industries the requirement to address individual student needs is another factor in the complexity of the learning environment. Drew (2007, p.113)

Four important characteristics of the art and design subject are:

1) Learning activities – Assignments, projects and briefs are the predominant learning tools within art and design education (Quality Assurance Agency for Higher Education, 2002). In short many of the learning activities are centred on a learning-by-doing/making approach. (See chapter 2 - literature review, for a consideration of supporting learning theories.)

2) Studio/practice-based and theory modules – In art and design, theory and practice are polarised (Cazeaux 1999). At undergraduate level, theory in art and design is commonly associated with the contextual or historical study of the subject, but can also include both discipline-specific and broader subject-based (art and design) principles. McKenna (1999, p. 1) suggested that: “There is a widely held assumption in art teaching that theory gets in the way of creativity and spontaneity.... The opposition between art theory and art making is commonly articulated in terms of visual versus verbal intelligence.”

3) Dyslexia in art and design – A disproportionate number of art and design undergraduate students (between 10% and 30%) exhibit dyslexic attributes (Brigden 2001; Wolff 2002; Malins 2006; Hillier 2007).

4) Technology has been embraced by art and design within the context of ‘making’ and evolving technologies have changed the face of art and design. We only need to think of desktop publishing to begin to appreciate its impact. Even traditional craft-based disciplines that are not normally associated with technology are not exempt from the technological evolution. For example, a cursory search on ‘eBay’ (an Internet-based auction site) shows a huge range of craft-based artefacts being sold directly by artisans who employ the technology, one could surmise, to support in part the future production of artefacts. Whether technology is employed in the creation or support for the future creation of artefacts, its impact is far reaching. The Quality Assurance Agency for Higher Education (2002, p.7) asserted: “Practice-based programmes also provide opportunities to develop technical skills, particularly in the new media and technologies, which have become essential elements in most areas of art and design...”

While the use of technology is not new to art and design, Drew and Williams (2002) found that the focus of art and design teachers has been on the appropriate use of technology as an instrument in creativity (making) rather than a means to support learning. They suggested that this was partly due to approaches to

teaching which neglect aspects of student learning. These approaches have their roots in traditional studio-based methods of teaching. Swan (2002) described this as:

...more or less a 'sitting-by-Nellie' approach. Most of the teachers in art and design would call it a traditional 'atelier' method derived from the master artist/craftsman showing an apprentice how to do it, which is a kinder description but it comes to the same thing. Swan (2002, p.50)

Drew and Williams (2002, p.147) however asserted that there has been a shift towards a more student-focused approach to teaching by teachers and suggested that: "It is this group of teachers who conceive of learning technology with a learning focus who are more likely to conceive of teaching with a student focus."

With the exception of the DVD ROM (Farshad *et al* 2001) entitled 'Seeing Drawing' (see Element 2 p.257 of the supporting creative works for a review of this artefact), all of the art and design TSL work in the available literature remain both heavily text-based and the content theme predominantly theoretical in nature. For example, the work of Peacock and Andrews (2004) within the Joint Information Systems Committee (JISC) funded 'e-studio project' described several artefacts, each of which is situated either within a theoretical domain, such as the 'Film Noir' learning object or, in the instance of the 'Photo Essay' learning object, attempts to bridge the divide between theory and studio-based practice. Goult (2004 p.6) described the successful use of PowerPoint and jpeg files in a VLE and reported that: "The use of the VLE for historical and contextual modules has been very successful." However no work was found which sought to support or enhance a student's ability to 'make', which is the essence of studio-based practice.

For subjects that are primarily focused on cognitive development and traditionally supported by text-based learning material, the transition to a TSL text-based learning environment is a relatively simple one. However, for those subjects which by their nature require the development of practical skills through haptics, the development of manual dexterity, and material manipulation, (developed through studio-based practice) such a transition to a TSL environment is more problematic.

Virtual Learning Environment (VLE) and art and design

Responding to the drive by educational managers to employ TSL, art and design academic staff with limited learning technology production skills teased out theoretical strands within existing practice-based study as a means of populating

the predominantly text-based virtual learning environments. (For an outline of the VLE within the context of the field of TSL see chapter 2 – ‘VLE’ p.32)

The initial limitations with regard to the types of content and nature of engagement the VLE first supported at the University of Wolverhampton is best illustrated by Brett (2002) who proposed a number of teaching and learning activities that could be supported by WOLF. These were:

For Teaching:

- Lectures
- Seminars
- Discussion groups
- Case studies
- Model exam answers
- Guided self-study work - e.g. self-assessed questions
- Simulations conducted through the forum.

For Learning these include:

- Discussions (email and text messaging boards)
- World Wide Web links - resource bank
- Group summaries of articles
- Peer self-assessment
- Study skills - time management
- A rank exercise
- Example exam answers.

Extracting theoretical content from within practice-based study to populate text-based TSL environments exacerbates the polarisation of theory and practice within art and design. Add to this the disproportionate number of dyslexic students within art and design who can be debilitated by text-based environments and the complexity of adopting TSL in art and design, I hope, starts to become clearer.

Jones, Zenios and Griffiths (2004) confirmed the view that:

Discipline and subject area is a significant factor affecting teaching and learning in higher education. In particular there appear to exist disciplinary differences in the way that digital resources are being integrated into teaching and learning within disciplines. Jones, Zenios and Griffiths (2004, p.8)

Goult (2004, p.1) observed that: "Teaching in art and design is often studio-based and does not appear to transfer easily to the on-line environment." Peacock and Andrews (2004) suggested that a belief persists by art and design teachers that:

TSL threatens traditional teaching methods and relationships...There is a widespread anxiety that TSL is likely to foster shallow and surface learning and is fundamentally ill-suited to the creative/intuitive and polemical/didactical requirements of art and design education. Peacock and Andrews (2004, p.1)

Considering the cognitive and skills outcomes of utilising TSL, Woods (2004, p.189) pointed out that: "...in art and design, the computer shifts the emphasis from the left hemisphere of the brain to the right - i.e. allowing more focus on the message, less on the execution." In considering this cognitive shift, Logan *et al.* (2007, p.10) suggested: "the mode of learning that operates through processes of making might be downgraded in these circumstances."

In their review of Managed Learning Environment Activity in Further and Higher Education in the UK the Social Informatics Research Unit (2005 p.35) reported that at the University of Wales Institute, Cardiff: "There was a historical reluctance [in the School of Art and Design] to engage with the VLE because of the importance of studio-based, student teacher interaction." Additionally the review reported:

...the work of a School of art and design [Norwich School of Art and Design] presents some different requirements from other institutions, for example: The physical interaction with artefacts is essential to the study as is the real-life interaction between learner and subject. This cannot be replaced. (Social Informatics Research Unit 2005, p.109)

In considering the use of TSL within the art and design subject, one needs to appreciate the characteristics of learning and teaching - 'practicum' (see chapter 2 for an outline of the 'Art and design pedagogy - educational theory' p.24), the nature of the student (see 'A profile of DM1006 student cohort', chapter 3 p.77), and of course an understanding of what is to be learned / subject matter (see 'Task analysis and SRIT skills', chapter 3 p.90).

At the start of this project, (circa 2001) and as this project draws to a close in this write-up (2007/08) there continues to be an absence of work which seeks to explore the use of TSL to support learning and teaching that occurs within the practicum (studio-based practice) of undergraduate art and design education.

Research question, approach, arguments and project framing

Main research question

This research project seeks to contribute to our understanding of the use of TSL in the art and design subject area through the development of a case study. To this end this research project asks the question - 'Can TSL aid the acquisition and development of practical skills associated with sound recording a location-based interview, introduced (as part of studio-based practice) during a three-hour class to level 1 undergraduate art and design students?'

Approach

To answer the above question, in the practice-based aspect of this research project, I designed, produced and evaluated a TSL artefact. This practice is framed within, informed and supported by research in a number of cognate fields (see 'Framing this multi- and inter-disciplinary practice-based study' on the following page). This thesis presents the cognate groundwork and context in which this project has been undertaken. It documents the practice including the design and evaluation of the artefact and the findings of the research. In essence this thesis, accompanying artefact and supporting creative work represent the first detailed case study of the design and implementation of TSL in the studio-based practicum of the art and design subject.

Arguments

In addressing the main research question I will argue that:

1) The design and evaluation of TSL is a multi- and inter-disciplinary endeavour requiring a holistic approach. This approach is:

- grounded first in an understanding of the audience, subject matter (in this instance SRIT) and learning context / environment;
- upon which a comprehensive consideration and/or understanding of user experience design (UXD) is built;
- where theory informs rather than leads practice.

2) I also argue that, within a holistic approach to the design and evaluation of TSL, the critique (review) of existing TSL artefacts is a valuable tool in helping to identify, reflect upon, and inform our understanding of TSL.

Secondary complementary questions

In addressing the main research question (above) two associated questions were also considered across this thesis, its associated practice-based aspect and accompanying supporting creative works:

1. What is the framework for this research project? (See 'The cognate framing of this multi- and inter-disciplinary practice-based study' below and chapter 2 - 'Project framing and practice model' p.68.)
2. What factors relating to the design of the TSL artefact either enhanced or impeded skill acquisition? (See chapter 7 - 'What factors in the design of RecordingCoach impeded or extended SRIT?' p.168 and chapter 8 - 'Project reflection, original contribution and further research' p.174.)

The cognate framing of this multi- and inter-disciplinary practice-based study

Figure 1 Framing of this multi- and inter-disciplinary practice-based research project

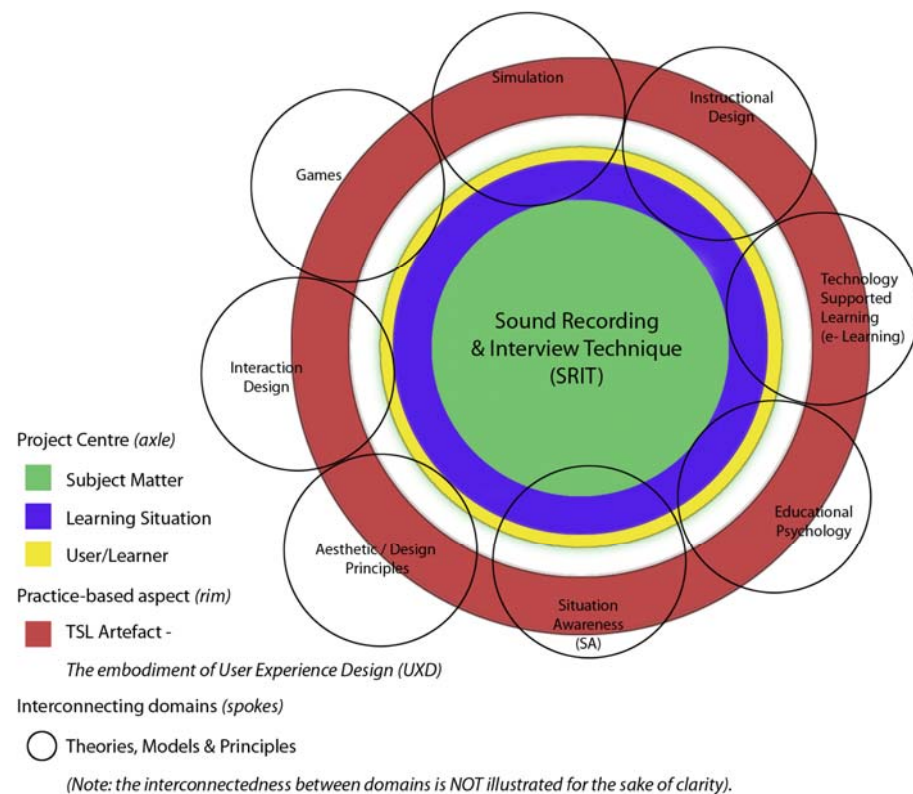


Figure 1 illustrates how this multi- and inter-disciplinary practice-based research project is framed within various cognate fields. At the project centre are three elements, 'subject matter' (SRIT skills) 'learning situation' and 'user/learner'. Encircling this core is the practice-based aspect of this research project - the design,

development and delivery of a TSL artefact. Linking and informing both the artefact and central elements is a host of theories, models and principles drawn from various associated 'domains' or cognate fields. Domains also intersect one and other. For example, educational psychology intersects e-learning, instructional design, games and simulation. However, for the sake of clarity such intersections are not illustrated here. Finally domains also intersect either one or more aspects of the three central project elements that in turn link back to the TSL artefact.

Bicycle wheel structure

A simplified way of making sense of how this project is framed is to relate the structure to that of a bicycle wheel. The axle of the wheel represents the project's centre (including the three aspects - subject, situation and learner), encircling the axle is the rim (TSL artefact - the embodiment of UXD discussed in chapter 2), and it is the spokes represented by the theory, models and principle domains which link the rim to the axle.

In the next chapter I review a range of literature across the supporting cognate domains illustrated in Figure 1 (shown on the previous page). In this chapter I also assemble the evidence and present the case for the arguments outlined in this chapter.

Chapter 2 - Literature review

Through a review of available literature a range of theories, models, and principles are considered. These have informed the project's approach to the design, realisation and evaluation of the practice-based aspect of this project namely the TSL artefact.

A characteristic of a literature review within the context of action research is the emergence of new literature seams that arise through the iterative on-going reflection within practice which in turn become incorporated into the body of understanding (Herr and Anderson 2005). This is a particular challenge where the conventions of a classic thesis structure dictate the discussion of theory (literature review) abstracted from the reflection on and in practice. To a greater degree, it was the reflection on and in practice that provided the direction and scope of the literature reviewed here. As such this review draws from the cognate fields of educational psychology, technology supported learning (e-learning), instructional design, simulation, games, interaction design, aesthetic / design principles and situation awareness (see also Figure 1 'Framing of this multi- and inter-disciplinary practice-based research project' p.21). (See also 'Scope of the review' on p.66 towards the end of this chapter.)

The review of literature has been drawn from three perspectives, those of the teacher, interaction designer and researcher, which have been born out of the practice-based and action research nature of this project. (For a consideration of these three perspectives see p.67 'A trilogy of perspectives and roles' later in this chapter. See also chapter 8 - 'A practice-based approach' p.174.)

Unifying these three viewpoints I will argue that the design and evaluation of TSL is a multi- and inter-disciplinary endeavour requiring a holistic approach. As such this requires the approach to be grounded in an understanding of the audience, subject matter (in this instance SRIT) and learning context / environment, upon which a comprehensive consideration and/or understanding of UXD is built, where theory informs rather than leads what we do as teachers and interaction designers.

Further to those theories, models and principles identified in this chapter, others emerged through iterative reflection within practice. For the sake of convention several of these (theories/models/principles) are presented in this chapter for

example modality and the principles, while others are highlighted and reflected upon, situated within the account of the research practice. As such this chapter should not be considered the sole measure of the theory, models and principles upon which this practice-based multi- and inter-disciplinary research project has drawn.

Art and design pedagogy – educational theory

In chapter 1, I outlined several characteristics of the art and design subject. To aid with a deeper understanding of the subject it is helpful to consider the educational theory that underpins art and design. However, this is problematic. Whilst art and design pedagogy is constructed on an educational framework that can be traced back to the 19th century (Bird 1992; Quality Assurance Agency for Higher Education 2002), today there exists no clear single theoretical model of learning and teaching upon which art and design is based; instead art and design pedagogy draws upon a number of existing theories of learning (Sagan 2007). There are several factors that have driven diversity in approach not least the variety of disciplines across the subject. Richmond (1991, p.11) suggested that there are “irreducible differences among the traditional school disciplines.” Kolko's (2007) distinction between art and design helps to illustrate the diversity at its most basic level within this subject area.

...there is a subtle distinction between artist and designer. An artist makes a statement, a distinct argument, through his canvas or clay or metal, and the viewer responds. A conversation evolves, through acceptance, or rejection, or understanding or bewilderment. The artist rarely claims responsibility to the audience...designers create a design that assists the viewer not only in experiencing a particular emotion but also in truly understanding the content. Kolko (2007, p.11)

The breadth of disciplines within the subject is one factor contributing to diversity. Davies (1997) offered a historical perspective of why diversity has evolved within the art and design subject area, attributing this to the expansion of disciplines and pedagogical differences, the disbandment of the CNAAC (Council for National Academic Awards) in 1992 and wider institutional changes.

With the overarching, all seeing body of the CNAAC, a relatively stable structure of courses...it was not too difficult to say how it was for everyone. Nowadays, the absence of a national awarding body, the subsequent incorporation of institutions, modularity and its attendant fragmentation of courses and external examiners and new quality and assessment demands have contributed to a much less predictable sector. (Davies 1997, p.4)

Even with the increased diversity of disciplines, governance and wider institutional changes in the art and design subject, studio-based practice and the use of assignments/projects as a learning and assessment tool, remain dominant features of art and design teaching and learning.

Learning by doing

Drew (2007, p.113) stated: "Learning in the creative subject areas (art, design and communication) has been recognised as having some unique characteristics such as learning by doing, emphasis on creative and innovative thinking and longer and more individual interactions between tutors and peers."

Both studio-based practice and assignments/projects are related to a learning-by-doing approach, the foundation of which can be linked to experiential learning theory, which itself is attributed to the work of John Dewey in the 1920s and 30s, (Neill 2003a/b; Kolb 1984), Kurt Lewin with his contributions to experiential learning in training and organisational development and Jean Piaget's work on cognitive development. Much work has been carried out in this area, including work by David Kolb and Argyris and Schon (Keeton and Tate 1978) amongst others. Kolb (1984, p.38) offered us a working definition of experiential learning: "Learning is the process whereby knowledge is created through the transformation of experience."

Kolb clarified his definition by outlining four critical aspects to the learning process.

1. Emphasis is on the process of adaptation and learning.
2. Knowledge is a transformation process continuously created and recreated.
3. Learning transforms experience both objectively and subjectively.
4. To understand learning one must understand the nature of knowledge.

The dominant model of experiential learning is that of a four-stage learning process. There are many variations on this model including for example Argyris-Schons' theory of experiential learning (Keeton and Tate 1978); the most widely quoted however is Kolb (Keeton & Tate 1978; Honey and Mumford 1986). Kolb's learning cycle defined the four stages as:

1. Reflective Observation (RO)
2. Abstract Conceptualisation (AC)

3. Active Experimentation (AE)
4. Concrete Experience (CE)

The basis for learning, Kolb suggested, is the transactions between each of these stages. The nature of each transaction is defined by the way experience is gained and processed into knowledge.

Figure 2 Kolb's structural dimensions underlying the process of experiential learning and the resulting basic knowledge forms. (Reproduced from Kolb 1984, p42)

Kolb also offered an experiential theory for development. The theory took as its basis the learning cycle and knowledge forms above (see Figure 2) and suggested that development is related, in simple terms, to the level of complexity of the aforementioned transaction.

Reflection and the practicum

Only experience that is reflected seriously will yield its full measure of learning, and reflection must in turn aim at testing the newly refined understandings by further experience. Our duty as educators is both to provide the experiential opportunity and to make sure it can yield learning. That is we must provide a framework for regularly analysing the experience and forming new concepts and theories, and then submitting these new concepts to the test of experience. (Doherty *et al.* 1978, p.25)

Doherty *et al.* (1978) advocated the importance of the repetition of the learning cycle in developing learning. I would suggest another way to describe this is 'practice'. (For a reflection on 'practice' within the learning and teaching context of this practice-based research, see chapter 3, p.88.)

As mentioned towards the start of this chapter, Donald Schon is credited as a contributor to 'learning by doing'. However it is Schon's (1987a) work on reflection-in-action and the 'practicum' that has very close links with art and design pedagogy. This work has to some extent been overshadowed by his earlier work on reflective practice. Logan (2008) suggested that it was Schon's emphasis on the uniqueness of the practicum that led to less academic interest in this idea. The characteristics of its uniqueness fit the art and design subject particularly well.

Logan (2008, p.15) reported that in art and design: "The tradition of practicum pedagogy provides graphic designers with a sense of their shared specialist knowledge and community affiliations." Schon (1987a, p.40) observed that practicum do exist "in the deviant traditions of studio and conservatory".

Schon (1987a, p.37) described the practicum as "...a setting designed for the task of learning a practice. In a context that approximates a practice world, students learn by doing, although their doing usually falls short of real-world work. They undertake projects that simulate and simplify practice...".

Reflection-in and on-action and knowing-in-practice are at the heart of the practicum. Schon (1987a) differentiated between knowing-in-action and knowing-in-practice. Knowing-in-action, he suggested is an intelligent action, observable like riding a bike. It is a kind of tacit knowledge, characterised by a difficulty of an individual to articulate how they know. Whereas: "Knowing-in-practice is exercised in the institutional setting particular to the profession, organised in terms of its characteristic units of activity and its familiar types of practice situations, and constrained or facilitated by its common body of professional knowledge and its appreciative system" (Schon 1987a, p.33).

Reflection, Schon (1987a) suggested, is an action triggered by some element of surprise. The individual becomes aware of some anomaly while undertaking an action. Action may be reflected upon in one of two ways. Either reflection takes place after an action, where the individual reflects upon the 'surprise' in-action and considers how their knowing-in-action may have contributed to this, Arendt (1971 in Schon 1987a p.26) called it a "stop and think" response; or reflection may occur in an "action-present" period of time where the individual can still make a difference to the outcome. This second response is what Schon (1987a) termed "reflection-in-action". "What distinguishes reflection-in-action from other kinds of reflection is its immediate significance to action" (Schon 1987a, p.29).

Reflection-in-action, Schon (1987a) suggested, can be considered from different theoretical perspectives. The first is a constructivist perspective, the central tenet of which rests on an assertion that: "Individuals construct new knowledge from their experiences". Schon (1987a) related this to reflection-in-action by how an individual constructs professional artistry and professional competence. Secondly Schon (1987a) offered an objectivist perspective, where technical rationality is based on the relations between knowing and known, (where objectivism argues that objective knowledge is gained from perception by measurement). Viewing reflection-in-action from these two perspectives, as Schon (1987a) did, lends weight to a post-theoretical perspective of knowledge and learning. (This is discussed later in this chapter, see 'Borrowing theories - part 1 (learning and teaching)' p.36.) This view acknowledges each of these perspectives (in this instance constructivist and behaviourist) as finer granular representations (perspectives) of a complex aggregate which is learning and teaching.

Schon (1987a, p.33) described a professional knowing-in-action as: "embedded in the socially and institutionally structured context shared by a community of practice".

'Community of practice' is a term often associated with situated learning theory which is a theoretical model that is also linked to art and design pedagogy through its use of studio-based practices and the teacher as an embodiment of a practising artist / designer.

Situated learning

Situated Cognition (Learning) theory, whose exponents include Jean Lave, John Seely Brown, Allan Collins and Paul Duguid, is sometimes misconstrued as a theory singularly concerned with the authenticity of the learning situation. Its scope however is broader. It is a theory of how knowledge and skills are learned. Clancey (1995) warned:

Situated learning is concerned with how learning occurs everyday. It is not a recommendation that teaching be "situated" or "relevant." It is a theory about the nature of human knowledge, claiming that knowledge is dynamically constructed as we conceive of what is happening to us, talk and move. Especially, our conception of our activity within a social matrix shapes and constrains what we think, do, and say. (Clancey 1995, para.2)

To encapsulate and articulate situated learning theory, Brown *et al.* (1989, p. 32) argued that: "Knowledge is situated, being in part a product of the activity, context and culture in which it is developed and used."

With these aspects in mind Brown *et al.* (1989) affirmed that learning activity should be authentic.

"Classroom tasks, therefore, can completely fail to provide the contextual features that allow authentic activity. At the same time, students may come to rely, in important but little noticed ways, on features of the classroom context, in which the task is now embedded, that are wholly absent from and alien to authentic activity". (Brown *et al.* 1989, p. 34)

Authenticity is the framework within which knowledge and skills are situated. This framework, Brown, *et al.* (1989) suggested is socially constructed through negotiation amongst a community of past, present, experienced and inexperienced members, and forms what they termed the 'culture'. Schools, they suggested, have their own culture and it is the school culture that is in conflict with authentic activity. Offering two examples of mathematic teaching in schools they illustrate how authentic activity can be established through the nurturing of a culture of mathematics. Unlike conventional approaches to teaching where teachers teach mathematics to pupils, the illustrated examples demonstrate an approach that establishes the teacher as a practitioner of mathematics whose pupils are inducted into the mathematics culture as novice mathematicians. Building upon this illustration Brown *et al.* (1989) offered us a methodology for what they term 'cognitive apprenticeships' and illustrated this by drawing parallels between this methodology and craft apprenticeships.

Apprenticeships exist inside their respective cultures, or as Clancey (1995) suggested, 'social matrix'. Social interaction and collaboration takes place between peers and experts within these frameworks and as such, cognitive apprenticeships can be considered situated within the social constructivist paradigm. Within such a learning context, peer collaboration is significant in aiding the acquisition of complex skills and knowledge (Lou 2004; Hummel *et al.* 2006).

Lave and Wenger (1991) referred to the role of 'legitimate peripheral participation' as a means of knowledge acquisition within situated learning. This term is used to describe cultural immersion with indirect engagement in activities. Brown *et al.* (1989) suggested that this type of peripheral participation is important for people entering the culture. This can be illustrated within the context of a hairdressing

apprenticeship. The novice or junior hairdresser often starts by sweeping the floor in the salon. Within this environment they are introduced to the culture of the profession and acquire knowledge through observation of and interaction with fellow novices (collaborative learning) and professional practitioners, clients and managers. The novice is engaged in the culture but is not participating in some activities, for example cutting hair. As the novice becomes more immersed in the culture, the range of activities increases along with the ways in which knowledge is acquired. (For a reflection on 'authentic activity' within the learning and teaching context of this practice-based research, see chapter 3, p.87.)

Technology supported learning (TSL)

As TSL continues to evolve and grow, new names and terms are coined to describe the field and aspects of it. For example, Logan *et al.* (2007) in their report on distributed e-learning in art and design, defined e-learning (an emergent term since the start of this project) by referring to a general outline definition: "learning facilitated and supported by the use of information and communication technology" (JISC 2004 in Logan *et al.* 2007, p.3), a definition equally relevant to the term TSL. TSL is the term used in this thesis for no other reason than it was, at the time of the start of this project, the predominant term or 'buzz word' widely used. For the sake of clarity TSL, e-learning, and computer based training (CBT) should be viewed as synonymous in the context of this thesis, their foundations being rooted in the aforementioned general outline definition.

TSL – a landscape of research and practice

Ravenscroft (2003a) suggested that the foundations of TSL were rooted in the 1950s within the scheme of programmed instruction and teaching machines developed to implement Skinner's behaviourist conceptions. However, it is the last 15 years that has seen a rapid growth in TSL (Boyle 2002, Conole and Oliver 2007b), which in turn is transforming education (Conole, 2004). Despite this, as a field of research and practice, models of TSL are eclectic and still developing (Logan *et al.* 2007, Conole 2004).

While there has been a growth in the use of TSL, Conole (2004, p.1) observed: "e-learning is still marginal in the lives of most academics, with technology being used for little more than acting as a content repository or for administrative purposes." Cook *et al.* (2007, p.56) also observed: "All too often the use of technology means little more than putting lecture notes on the web." Dyke *et al.* (2007, p.85) observed that: "Much of e-learning development represents little more

than transfer of didactic approaches online, the 'web page turning mentality' linked directly to assessment and feedback." Cook *et al.* (2007) suggested that this type of 'didactic' mode of delivery focuses on content rather than the use of technologies to promote active learning, and argue that we need to design for learning and not content transmission.

While the proliferation of a 'notes on the web' approach to TSL may be linked to a poor or inappropriate consideration of pedagogy by the teacher, other factors may also significantly drive such an approach. With the rapid growth of TSL some senior managers in learning institutions have made rash and ill-informed decisions with respect to the choice and implementation of VLEs (Conole 2004). "In some cases institutions naively decreed that all courses must use the VLE without considering whether it was pedagogically appropriate or appreciating the associated staff development needs and time implications" (Conole 2004, p.3). As such, the use of VLEs is a peripheral activity for many teachers. Mayes and de Freitas (2004) pointed out that the implementation of TSL can be undertaken for both pedagogic and pragmatic reasons, pedagogically to enhance learning and/or pragmatically implemented, for example, to drive cost-efficiency or provide access to learning. Peacock and Andrews (2004, p.1) noted that among teachers in art and design: "The belief persists that TSL is being implemented for economic not pedagogic reasons and that TSL threatens traditional teaching methods and relationships while simultaneously requiring staff to be perpetually available to their students."

The multi-dimensional aspects of TSL, (what drives its use, what constitutes its make-up), are key challenges faced by practitioners and researchers in what Mayes and de Freitas (2004, p.4) described as a 'complex current landscape'. As a research area, Conole and Oliver (2007b) suggested:

E-learning is both multi- and inter-disciplinary, covers a vast range of research topics, from those that focus on technologies through to wider socio-cultural research questions, and addresses issues concerned with the impact of technologies on learning and teaching, professional roles and identities, organisational structures and associated strategy and policy. (Oliver 2007b, p.3)

The diversity of perspective within TSL research and practice is, in part, fuelled by the various interests of its stakeholders such as administrators, senior managers, teachers, frequently referred to in the reviewed literature as 'practitioners', learning technologists or what Scott (2004, p.3) termed 'designers' (also referred to as courseware developers, instructional designers, interaction designers in the

wider associated literature), researchers (with various foci) and of course the learners. These stakeholders are what (Conole *et al.* 2003 in Conole 2004, p.2) termed “multiple voices” and is an existing identifiable TSL research theme.

Conole and Oliver (2007b) observed that the themes of much of the present-day TSL research literature can be clustered around four interrelated foci – pedagogical research, technical research, organisational research and socio-cultural factors. Comparing Conole and Oliver’s (2007b) framework with an earlier presentation of the framework by Conole (2004), it is interesting to note that although there is a difference of three years between the publication of the two versions, there is no difference in the landscape or foci within e-learning research.

It is also worth noting here that if one considers the main research question (see chapter 1) driving this practice-based multi- and inter-disciplinary research project it would appear that this project sits within the ‘pedagogical research’ foci, however on deeper reflection and considering the first complementary research question, it is difficult to clearly position some aspects of this project within Conole and Oliver’s (2007b) framework. I discuss the basis of this difficulty later in this chapter (see ‘UXD and TSL design – a holistic perspective’ p.47) as part of my argument for a holistic approach to the design and evaluation of TSL.

VLEs, learning objects and toolkits

Whilst the focus of this research project is on the use of TSL to support learning and teaching within studio-based practice (approached from a practitioner / designer’s perspective); as a means of contextualising this research within the complex landscape of TSL research and practice it is worth briefly looking at TSL developments from an alternative perspective. How do we design and produce TSL, when we lack technical know how? – Pragmatic concerns from an institutional /managerial perspective.

VLE

One response has been the development of the Virtual Learning Environment as referred to in the introductory chapter. (See chapter 1 - ‘Technology supported learning environment’ p.14 and also ‘Virtual Learning Environment (VLE) and art and design’ p.17.) The VLE emerged initially out of the pragmatic need for institutions to support the delivery of learning technology by teachers with little or no technical skills. As such these early VLEs were popular with practitioners because of their ease of use (Littlejohn *et al.* 2007). VLEs started out as simple on-

line (Internet or Intranet) repositories for lecture notes, presentations and the creation of textual hyper-linkable web pages. In some instances the VLE construct was built upon previous institutional projects, as is the case with WOLF at the University of Wolverhampton, while other examples were sourced from the open-source applications community, for example 'Moodle' (<http://moodle.org/>). As this type of learning technology has continued to evolve, and as its use has become more commonplace, the VLE has shifted from what Masterman and Vogel (2007) termed 'pedagogically neutral' environments to ones which now facilitate and foster a growing interest in reflective and social constructive models of learning (Masterman and Vogel 2007). While the VLE is not without its critics, it has been very successful and as such today it is a mainstream tool utilised by most UK universities (Cook *et al.* 2007).

Ravenscroft and Cook (2007) pointed out that most learners are "highly fluent" in the use of technologies and as such it would be advantageous to build on the learner's existing use of technology rather than imposing organisational mechanisms such as VLEs. Such a shift in approach would transfer the focus of attention from the teacher's world to that of the learner. Similarly criticisms are levelled at the construct of learning objects where regard for content over learning can take precedence.

Learning objects

Many institutions now employ learning technologists / e-materials developers as a means of facilitating teaching staff (practitioners) to develop TSL content which in turn helps to populate VLEs with more advanced (both technologically and pedagogically) learning activities. A primary development within this framework is the 'learning object' construct. According to Wiley (2002, p.3) the learning object is the "...technology of choice for the next generation of instructional design, development, and delivery, due to its potential for reusability, generativity, adaptability, and scalability." Such values, I suggest are derived out of a pragmatic institutional perspective rather than a pedagogic one. The term 'learning object' is a much discussed and debated subject (Friesen 2003). Wiley (2002, p.7) defined a learning object as "any digital resource that can be reused to support learning". The Centre for Excellence in Teaching and Learning in Reusable Learning Objects defined a reusable learning object as "...web-based interactive chunks of e-learning designed to explain a stand-alone learning objective. The fact that the learning object has been broken down to a low level of granularity facilitates its reuse in different learning and teaching situations" (RLO-CETL 2005, p.1). It is concern for 'granularity' that is a particular focus of attention by TSL researchers in this area.

Aldrich (2005) defined two levels of granularity for simulation-based learning objects, the first being a two or three minute mini-course, and the second being what he describes as “elements within a course”. Wiley (2002) pointed out that learning objects can have different qualities and it is the prevalence of these qualities that distinguishes one from another. As such Wiley (2002) described five types of learning object:

1. Fundamental (e.g. an image);
2. Combined-closed (e.g. a video);
3. Combined-open (e.g. a hyper-linked web page linking image and video in some context);
4. Generative-presentation (e.g. a JAVA applet which can manipulate and present rule-based data);
5. Generative-instructional (e.g. simulation supported by instruction and facilitating practice).

Wiley (2002, p.22) suggested that: “Distinguishing between the learning object types is a matter of identifying the manner in which the object to be classified exhibits certain characteristics.” Observing the shift towards defining the granularity of learning objects within their context of use, Conole (2007) highlights the work of Littlejohn *et al.* (forthcoming in Conole, 2007) who consider granularity as four levels of complexity:

- Digital assets - normally a single file (e.g. an image, video or audio clip) sometimes called a 'raw media asset';
- Information objects - a structured aggregation of digital assets, designed purely to present information;
- Learning activities - tasks involving interactions with information to attain specific learning outcome;
- Learning design - structured sequences of information and activities to promote learning.

Littlejohn *et al.* (forthcoming in Conole, 2007, p.82)

Concern for granularity is tied to a need to clearly define the learning object, essential to facilitating the object's reuse in a variety of learning contexts. High quality TSL is expensive to produce (Boyle 2003). The construct of the learning object promises a better return on investment (ROI) and as such large sums of money have been spent by governments on the development of learning objects, methods of cataloguing learning objects and the establishment of digital repositories in which these objects reside (Friesen 2003; Ravenscroft and Cook 2007). (See also ‘Learning design and design for learning’ p.45, later in this

chapter.) Friesen (2003) observed that a considerable amount of research attention around learning objects is based on a concern for specifying standards rather than a concern for 'learning'. In observing the prevalence of interest in learning objects Ravenscroft and Cook (2007, p.212) warned us that: "...making content easily available and accessible does not lead to learning in the same way that opening a library does not lead to a literate local community." Furthermore Ravenscroft and Cook (2007) asserted that in learning design, consideration of a learning object's use should come before consideration of its reuse.

Toolkits

"Few academic staff have had the opportunity to develop the pre-requisite expertise to design and implement an effective strategy for acquisition, use and evaluation of either new materials or methods of delivery" (Conole and Fill 2005, p.3).

Toolkits are an essential aspect to the development of TSL. Like many terms in the field of TSL and UXD (see 'Borrowing theories - part 2 (user experience design (UXD)' later in this chapter), the term 'toolkit' means different things to different TSL stakeholders. For example Aldrich (2005) suggested that at one extreme a toolkit is a programming language, at the other it is an application such as Microsoft PowerPoint; both provide the means of effectively building different types of TSL content and are as such authoring environments. Conole and Fill (2005, p.6) however suggested that a toolkit is a support tool, part of a support continuum with: "...theoretical maps at one end, and restrictive but easy to use software 'black boxes' at the other."

Creating learning activities, choosing the appropriate tools and supporting theories are complex processes for practitioners (Conole *et al.* 2007). As such, a wide variety of what are termed 'toolkits' have been and are being developed to assist practitioners (teachers) as well as other stakeholders utilise TSL. One such example within the Geography subject area is DialogPLUS. This is a guidance toolkit based on learning objects (or what the project terms 'nuggets') and a 'taxonomy of learning activities'. The taxonomy is based on three components, 'context' derived from Bloom's (1956) taxonomy of educational objectives; 'pedagogy' based on Mayes and de Freitas's (2004) three theoretical perspectives of learning (see 'Borrowing theories - part 1 (learning and teaching)' later in this chapter); and 'task' which is a description of the type of teaching technique used. The toolkit can be used as a step-by-step guide in selecting and mapping out various learning objects contained within a pre-existing database of learning

objects. With considerable criticism levelled at the resource rather than design for learning focus of many learning objects, Conole *et al.* (2007, p.106) pointed out "...one could argue that this [DialogPLUS] is still very much a component-based approach, which is problematic because the relationships between the components are not well understood".

A different perspective of a 'Toolkit' is offered by the Scottish Funding Council (2006 para.2) who reported the need for "...the development of good practice advice, such as a 'toolkit' to support institutional managers in making decisions about future plans for investment in e-learning".

Yet another example is one represented by the toolkit theme, within a three year JISC funded project entitled 'E-learning framework and tools'. The aim of the project was to provide support for the: "... lack of pedagogical flexibility and innovation in the design of e-learning tools, environments and architectures" (JISC (2008, para.1). The toolkit project was primarily aimed at "providing software libraries that enable developers to create applications that provide and consume services defined within the e-Framework" (JISC 2007, para.2).

While the use of the term varies across stakeholders, in essence, 'toolkits' can be viewed as the bridge that spans the divide between a stakeholder's desire to use, and the actual use of TSL.

Borrowing theories – part 1 (learning and teaching)

The initial review of TSL pedagogy-focused literature identified two predominant inter-related concerns - the underpinning theory of learning that supports TSL and pedagogic models for their implementation.

Conole (2004, p. 2) asserted: "e-learning research has not arisen in isolation and feeds on a number of cognate disciplines." As such learning technology borrows from a wide range of established educational theories, models and principles. Ravenscroft (2003a, para. 12) suggested, "We have never really settled on a particular relation between learning or pedagogical theory and e-learning design." A unified theoretical (theory of learning) base for learning technology does not exist. Instead TSL borrows from a wide range of contributors, a view also widely endorsed at a panel discussion (Oliver *et al.* 2001) held at the 8th international Association for Learning Technology Conference in 2001 (ALT-C 2001). Oliver (2002a) later suggests that learning technology is a new landscape, fast changing

and as such any attempt to define it would be premature. The absence of a unified theory is problematic for some stakeholders who criticise TSL research for its lack of theoretical underpinning and its anecdotal reporting (Conole 2004, p.3). Oliver (2002a, p.1) observed: “For some, a theory was a touchstone, a guiding set of principles, the foundation on which their work was built. For others, theories were tools, and the important thing was having the right one for the job.”

Considering the nature and characteristics of learning Dyke *et al.* (2007) acknowledged the “rich theoretical seams” that exist, highlighting for example, Kolb's (1984) experiential learning cycle (discussed earlier in this chapter) and Laurillard's (2002) conversational framework (discussed later in this chapter). However, Dyke *et al.* (2007) noted that despite the prevalence of these ‘seams’ they are rarely applied to TSL. Mayes and de Freitas (2004) suggest that the psychological theories underpinning educational design can be grouped into three broad and fundamentally different perspectives:

- The associationist/empiricist perspective (learning as activity)
- The cognitive perspective (learning as achieving understanding)
- The situative perspective (learning as a social practice)

Mayes and de Freitas (2004) reflected that these different perspectives can be viewed as different levels of aggregation and suggested that TSL in modern HE/FE (further education) curriculum design is a blended combination of two or more of these perspectives.

In a similar vein, Dyke *et al.* (2007, p.96) argued that learning is complex and multifaceted and the “fossilisation of learning theories into a set of prescriptions for practice is unhelpful”. Dyke *et al.* (2007) suggested that it is the distillation of learning into key characteristics that offers an enabling framework for e-learning designers and practitioners. This ‘enabling’ framework is based on the premise that: “learning can be nurtured by fostering thinking and reflection, experience and activity, conversation and interaction” Dyke *et al.* (2007, p.97).

What is increasingly apparent from the available contemporary literature is a shift amongst pedagogy-focused TSL researchers away from an alignment to one theoretical perspective and a movement towards a more general appreciation of the various perspectives (for example, constructivism, behaviourism, situated cognition) within learning theory. Ravenscroft (2003a, para. 12) suggested

“...active participation in this [what it takes to learn] discourse, rather than adhering to any particular theoretical stance, is the best way to inform e-learning design”. Whilst this position is emergent amongst TSL pedagogy researchers, it is not new. For example within the discipline of instructional design Wilson (1999) observed that many teachers and instructional designers adopt a toolbox of theories from which they are able to select, and compare problems from different theoretical perspectives. “I believe that good ID [instructional design] practice is informed by theory, but not slave to it” (Wilson, 1999, p.6).

Such a grounded approach is akin to a post-theoretical view of teaching and learning theories and models. Oliver *et al.* (2007, p.28) described a post-theoretical perspective as one which: “...acknowledges the disconnect in much learning and teaching practice between what teachers claim and what they do”. Roberts and Huggins (2004, p.6) described this perspective as one based on “pedagogical pragmatism [that] places the learner and the designer in contested social space illuminated by critical theory but grounded in survival”. A post-theoretical perspective is “characterised by project- and problem-based learning, applied and action research, and grounded and emergent theoretical approaches situated in communities of practice” Oliver *et al.* (2007, p.28).

Although previously stated in chapter 1, it is appropriate to reiterate here, as a practice-based multi- and inter-disciplinary project, this research takes a post-theoretical position with respect to knowledge and learning and grounds this within learning and teaching as it occurs within art and design studio-based practice. (See also ‘The starting point - A grounded approach’ p. 53 and ‘Reflection on this review’ p.66.)

An influential TSL pedagogic model

Laurillard’s (2002) work on the ‘conversational framework’ has influenced the development of TSL within higher education in the UK (Mayes and de Freitas 2004). At the heart of the framework is a teacher-constructed environment within which ‘reflection’, driven by an iterative conversation, occurs between teacher and learner. This conversation can either be between learner and teacher or it can be an internalised dialogue where the learner assumes both positions (learner and teacher).

Laurillard (2002, p. 75) stated that: “It is the role of the teacher to mediate the person-world relationship.” It is this ‘second-order’ view of academic learning

upon which the conversational framework is constructed, and Laurillard (2002, p. 87) suggested that the framework is "...applicable to any academic learning situation: to the full range of subjects areas and types of topic". However this 'second-order' view of academic learning is at odds with the art and design subject area, which is based predominantly on a first-order construct, namely experiential learning.

As Logan *et al.* (2007) stated: "The second order experience involved in the 'conversational framework' challenges a key expectation in some practice-based activities that students will enjoy extensive and personal 'first-order' engagement with learning, notably through making."

The ability of the framework to support the challenges within the art and design subject is limited; for example the framework could be considered appropriate to contextual and historical studies (theory). However, within the context of studio-based learning and teaching its suitability is questionable given its 'second-order' position. While having asserted that the conversational framework is applicable to 'all' subject areas and topics, Laurillard (2002, p.87) did however concede that the framework has limitations: "It is not normally applicable to learning through experience, nor to 'everyday' learning".

Thus far the focus of this literature view has been on aspects of learning and teaching, be it characteristics of the art and design subject area or the associated approach to theories and models informing TSL. While the heart of TSL is clearly learning and teaching, it is not the only theoretical base or for that matter discipline (teaching) upon which TSL draws.

Conole (2004, p.1) asserted that: "In the last decade we have seen a shift from a focus on information to an emphasis on communication and a realisation that the development of content alone does not lead to more effective learning, but we are still at the start of harnessing their potential."

Borrowing theories – part 2 (user experience design (UXD))

UXD is a central tenet of the practice of design and is a concern for a user's / learner's / audience's experience of, for example, a product, service, performance or environment. As such, concern for UXD exists in a host of contexts and at various degrees of aggregation (granularity). Here I look at UXD as it relates to TSL at different degrees of aggregation from three perspectives. The first looks at

UXD from a finer granular interaction design perspective, the second takes a wider learning and teaching perspective, and the third considers UXD from a holistic design perspective.

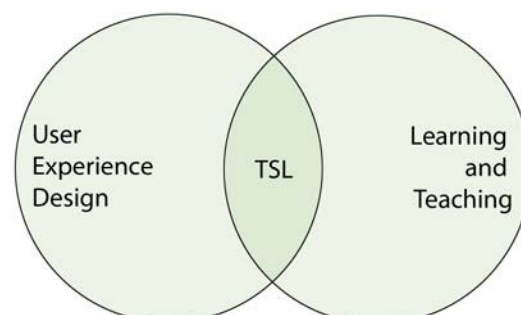
UXD – an interaction design (TSL - product) perspective

User experience can be viewed as how a product behaves or is used (Garrett 2003). Garrett (2003, p.10) suggested: “When a product is being developed, people pay a great deal of attention to what it does. User experience is the other, often overlooked, side of the equation - how it works - that can often make the difference between a successful product and a failure.” UXD is not concerned with the internal workings of a product, but the interaction between artefact and user. “Every product that is used by someone has a user experience” Garrett (2003, p. 10).

Concern for user experience fuels research in a variety of disciplines across a number of fields. For example within the field of computing and the discipline of application design there is a significant research focus on ‘human computer interaction’ (HCI). The focus on UXD within a particular field or discipline is based on the nature of the artefact under development or investigation. Within the field of product design, regard for user experience would include ergonomic factors, whilst also in the field of interaction design, the practice of interface design would be concerned with the affordance a particular interface metaphor promotes. (See ‘A common goal - usability’ for an elaboration on ‘affordance’ later in this chapter.)

While TSL is clearly grounded in a wider concern for learning and teaching, by its very nature i.e. its existence as an ‘artefact’ or what Garrett (2003) would term ‘product’, the design of TSL draws upon aspects of UXD. TSL can be viewed as a product that has a learning objective.

Figure 3. The relationship (afforded by TSL) between a product-based concern for UXD and learning and teaching



As outlined earlier in this chapter, there is no unified theory of TSL or for that matter learning and teaching. Likewise, in this overarching shared concern for user experience there is no unified theory of UXD. Within the digital domain, Hughes (2000, p. 147) observed: “diverse and contradictory” theories are expressed by different multimedia project stakeholders. I suggest that the “diversity” Hughes (2000) observes is, in part, connected to the differing perspectives across the fields and practices (disciplines) concerned with UXD.

Within the context of the development of a TSL artefact, concern for UXD not only draws on theories, models and principles from learning and teaching but also (based on the nature and characteristics of the artefact) it draws upon, for example, instructional design and educational media (Gagne 1985; Clark and Mayer 2008); human factors and SA (Endsley & Garland 2000; Wickens 2000; Endsley, Bolte and Jones 2003); HCI (Johnson 1992); interaction and interface design (Cooper and Reimann 2003; Hughes 2000; Preece, Rogers and Sharp 2002; Velthoven 2003; Gomoll 1993; Brown 2006; Barfield 2004; Benyon, Turner and Turner 2005; Garrett 2003; Perfetti 2001) ; games and games related design (Salen & Zimmerman 2004; Koster 2005; Mori 1970; Haywood 2005; Phillips 2005; Thompson 2004); simulation (Bill 1997; Garris, Ahlers and Driskell 2002; Aldrich 2005; Schmucker 1999) and design principles (Lidwell, Holden and Butler 2003; Kurosu and Kashimura 1995; Norman 2002; Williams 1994).

It is the characteristics of a TSL artefact (nature of learning activity) that in part, determine the fields and disciplines upon which our consideration of UXD draws. See also ‘The starting point - a grounded approach’ p. 53 and ‘Reflection on this review’ p.66.

A common goal – ‘usability’

It is generally agreed when developing interactive artefacts, that understanding one's intended audience, their relationship to, and interaction with, the subject matter and intended artefact content is important in establishing successful user engagement (Preece, Rogers and Sharp 2002; Garrett 2003; Barfield 2004; Cooper and Reimann 2003; Benyon, Turner and Turner 2005). Usability is a key aspect of UXD. (See also ‘The starting point - a grounded approach’ later in this chapter for an expanded discussion of understanding an audience within the specific context of learning and teaching.)

What makes an artefact easy to use (usability) is a much written about subject. A well-designed artefact should allow users to infer meaning and understanding,

'affordance' (Norman 2000; Cooper and Reimann 2003; Preece, Rogers and Sharp 2002; Benyon, Turner and Turner 2005) and should at its very best be intuitive to use.

In defining usability Preece, Rogers and Sharp (2002, p.14) suggested: "...usability is generally regarded as ensuring that interactive products are easy to learn, effective to use and enjoyable from the user's perspective".

Quoting the ISO standard (13407) in his definition of interaction design, Barfield (2004, p. 9) echoes this description of usability: "The usability of an interface is a measure of the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in a particular environment with that interface."

Interaction design itself is but one of many disciplines associated with usability. Benyon *et al.* (2005, p.5) described interaction design as a "fusion of skills" and depending on which author you refer to, the skills embodied within usability and the disciplines that contribute to usability vary. Common across the literature reviewed is a collective view that bringing about usability requires multiple skill sets, access to, consideration and analysis of a range of information, and above all, a user-centric approach. (See 'The starting point - a grounded approach' p.53. See also chapter 5 - 'User participation' p. 113.)

A UXD TSL model

In discussing a new theoretical base for understanding educational multimedia, Boyle (2002) draws a distinction between our understanding of how to promote effective learning and our desire to understand what goes on inside a learner's head. "We know a lot about the conditions that promote effective learning even if we do not understand the precise cognitive underpinning" (Boyle 2002, p4).

Boyle (2002) suggested that any desire to map cognitive psychology to TSL can be problematic. As Hammond (1993 in Boyle, 2002 p.4) pointed out: "We know very little about the detailed mechanisms of learning." Additionally there is, as Laurillard (2002) suggested, an inherent difficulty that exists when extrapolating theoretical constructs originally intended for other disciplines. As such Boyle's (2002) central argument was that: "...design insights are often best expressed at a different explanatory level from that of cognitive psychology".

Drawing on Anderson's (1990) three major layers of explanation, Boyle (2002) offered an alternative perspective of explanation (theory) within the context of TSL, by suggesting there exists, in the design of TSL, different layers of explanation

(theory). In particular there are two distinct and separate layers, one concerned with cognition the other, which he termed the 'interactional layer', is concerned with context. It is a concern with 'context' on the 'interactional layer' that Boyle (2002) asserted is of central concern for the TSL designer. "Context is a construction that makes selective holistic sense of the environment of interaction" (Boyle 2002, p.5). 'Contexts' can be interrelated, their design on the 'interactional layer' involving the action of three macro-functions:

- structure: structuring the learning content;
- interactivity: designing for user interaction with content;
- composition: the creation of a coherent overall composition, both within and across contexts.

Boyle (2002) drew parallels between these macro-functions and general educational concerns suggesting the first two correspond to concerns for curriculum (structuring of the content to be learned), while he links the third to theories in specific disciplines such as film theory.

Boyle (2002) acknowledged the importance of concerns beyond those of the underlying educational theory. While his suggestion that the focus of design of TSL should be on the 'interactional layer' (or what one may refer to as UXD), concern on this layer should be given over to understanding the 'context'. As such Boyle's (2002) assertion that we need to understand 'context' seems to advocate a grounded approach to TSL development, which is the approach adopted by this project. (See also 'The starting point – a grounded approach' later in this chapter).

When conceived as a product, the elements which make up TSL's construct are currently best illustrated by Garrett's (2003) 'elements of user experience'. The model is useful in that it illustrates the diverse and complex range of skills and disciplines that contribute to TSL and, by association, UXD. The 'elements of user experience' is a model for the application of theories, rules, disciplines, practices and tools (including those from learning and teaching) that can be seen in the wider multi- and inter-disciplinary context. (See 'The design and realisation of TSL – a multi- and inter-disciplinary endeavour' later in this chapter.)

Figure 4 Jesse James Garrett - elements of user experience model

While Boyle (2002) employed the term 'layers', Garrett (2003) referred to five 'planes' which are 'strategy', 'scope', 'structure', 'skeleton' and 'surface'. Assigned to each plane are various disciplines and concerns associated with the construction and design of a product-based (TSL artefact) user experience. The strategy plane, for example, focuses on the user needs and objectives of the artefact, (this can include the underpinning educational theory supporting TSL) while the scope plane encompasses content requirements and functionality specification, and is where the characteristic of the artefact is defined. Whilst each plane is dependent on the planes below it, Garrett (2003, p.26) pointed out: "dependencies run in both directions, with decisions made on upper planes, sometimes forcing a re-

evaluation (or an evaluation made for the first time!), of decisions on the lower planes.” Because of this interconnectedness Garrett (2003, p.27) suggested that a project should be planned in such a way that “work on any plane cannot finish before work on the lower planes has finished. The important consideration here is not to build the roof of the house before we know the shape of its foundation.”

The developmental overlap of the different planes (phases) supports an iterative design process. Such a process is a key characteristic of interaction design (Benyon, Turner and Turner 2005; Preece, Rogers and Sharp 2002).

UXD and TSL – examples from a wider learning and teaching perspective

Design has always been an element of teaching (Beetham 2007). Given that concern for UXD is central to the practice of design, UXD can be viewed as an aspect of design for learning.

Learning design and design for learning

Within learning and teaching the term ‘learning design’ is used in two different contexts. The first is the ‘IMS learning design specification’. IMS (Instructional Management Systems) is a global learning consortium, with a central concern for defining, and cataloguing ‘distributed learning’, which includes learning objects (discussed earlier in this chapter) via the use of embedded key descriptors or ‘meta data’. The focus of attention here however is with the second use of the term ‘learning design’, which relates to a dominant emergent paradigm that “...focuses primarily on the activities undertaken by learners, and only secondarily on (for example) the tools or materials that support them” (Beetham 2007, p.26).

Within this paradigm, the process for designing, planning and or structuring a learning situation is termed ‘design for learning’ (Beetham and Sharpe 2007b). Learning resources and materials, activities, environments, programmes and curricula can all be aspects of a ‘learning situation’ so long as each have been designed with a definite pedagogic purpose.

Making reference to Mayes and de Freitas’s (2004, 2007) three theoretical perspectives of learning (see ‘Borrowing theories - part 1 (learning and teaching)’) Beetham (2007, p. 26) pointed to: “...the central importance of activity on the part of learning. Several decades of research support the view that it is the activity that the learner engages in, and the outcomes of that activity, that are significant for

learning". It is the relationship between knowledge and learning activities within the context of specific subject matter (content) that is a focus of design for learning. As such design for learning is a subject-specific skill (Beetham 2007), the relevance of which is discussed later in this chapter. (See 'The design of TSL - a multi- and inter-disciplinary endeavour'.)

Blended learning – learning context

The relative strength of face-to-face teaching, coupled with the desire to have a more engaged learning experience, is core to the emergence of the concept of blended learning (Garrison and Vaughan 2007). Blended learning is a new approach to the mix of learning activities (Garrison and Vaughan 2007); for example, those afforded by learning objects alongside real world class-based activities. Bersin (2004, p.9) pointed out: "Learning requires a combination of content plus context", while Garrison and Vaughan (2007, p.6) suggested: "Blended learning necessitates that educators question what is important." Both blended learning and design for learning acknowledge the importance of learning that extends substantially beyond a singular concern for content. Such a focus on content has been a criticism levelled at the use of VLEs and learning objects.

When designing TSL one needs to consider the wider learning and teaching context in which the TSL will be used. How such material is embedded in learning and teaching practice is important (Laurillard 2002; Sharpe and Oliver 2007). For examples of how RecordingCoach was integrated into the class see chapter 5 - 'Margaret Weatherby, unpredictability, questions and answers' p.118 see also 'La vie en rose' p.138 in the same chapter.

It is worth also mentioning, within the wider context of learning and teaching, that the overall 'service' experience of a learner is one that is sought by teachers and institutions through the use of data collection tools such as module evaluation questionnaires (MEQs) completed by students towards the conclusion of their study. Such feedback is an integral part of the reflective practices of both the teacher and educational institutions that in turn informs the refinement or even redesign of learning activities.

Concern for user experience and thus UXD exists at different degrees of granularity within the learning and teaching context. Consideration of UXD for example exists: inside the construct of a TSL artefact; the way in which the TSL artefact is blended into existing teaching practices; and how these and other

factors, for example, environment - heating, lighting, access to learning etc. influence a learner's overall learning experience.

UXD and TSL design – a holistic perspective

As I briefly stated earlier in this chapter, when I attempt to place this research project within Conole and Oliver's (2007b) table of substantive research foci in TSL, I feel uneasy. This unease comes out of the trilogy of perspectives I have across this review which sees me as researcher, teacher and interaction designer. I feel it would be flippant to place this multi- and inter-disciplinary practice-based project under a 'pedagogy' heading. To do so would ignore the significance of UXD as an aggregate of the finer granular concern for pedagogy in the design, research and evaluation of TSL.

This leads me to argue here that a comprehensive (holistic) consideration of UXD affords researchers, designers and teachers (practitioners) the opportunity to consider a host of practices, techniques, theories, models and principles from which one can draw in the design and evaluation of TSL. As such it should be the perspective one first adopts and upon which the design of a TSL artefact should be built.

To illustrate the types of opportunities afforded by such an approach and how these opportunities come about, it is relevant to understand the process of design. Beetham and Sharpe (2007b, p.7) offered us their perspective of design: "One aim of design in all its forms is to generalise across cases, streamlining the process of future design by offering general principles of application or even universal patterns." Such a perspective suggests what design can do but does not offer us an insight in to how we go about what is a creative process.

To attempt to review literature on the process of design, or for that matter what one means by the term 'creative', I feel would lead us unnecessarily beyond the scope of this research project. With this in mind, in arguing my case, I focus specifically on one well-established (Hughes 2000; Foster 1996, 2007) technique in the creative disciplines, that of Young's (1975) 'A technique for producing ideas'. Central to the technique are two principles, the first being: "An idea is nothing more nor less than a combination of old elements" (Young 1975, p.25). (Young attributed this principle to the work of the Italian sociologist Vilfredo Pareto in his work entitled 'Mind and Society', first published in 1935.) The second principle is

'the ability to see relationships', which Young (1975) asserts is a cultivatable habit of mind.

Young's (1975) technique is used in numerous creative fields and disciplines such as advertising, multimedia (Hughes 2000), creative writing (Rothacker 2007), marketing (Oud 2004) and photography (Critchley 2007) and provides a simple 'how to' road map for producing ideas. I use this technique as a practising designer and have taught this technique to graphic design students, and interactive media undergraduates and postgraduates for a number of years.

Young's (1975) technique is based on five stages:

1. Browsing - You immerse yourself in the subject without regard for right or wrong, you make no value judgements, seek no concrete connections, you absorb as much as you can.
2. Chewing it over - This is your first attempt to make sense of your browsing, find connections. "...you feel the information all over, as it were, with the tentacles of your mind" (Young 1975, p.42-43).
3. Incubation - "You walk away from it and do something else entirely, to give your mind a chance to do its stuff" (Hughes 2000, p.161). It is interesting to note that at this point Young (1975) suggested that it is important to stimulate your emotions. This can be achieved by watching a film or listening to music. In explaining this stage Young (1975, p.47) says: "In the first stage you have gathered your food. In the second stage you have masticated it well. Now the digestive process is on. Let it alone - but stimulate the flow of gastric juices."
4. Illumination - On your return to the material, this is the point at which connections and ideas begin to take shape. Young (1975) asserted that so long as the three preceding stages have been thoroughly undertaken you will experience illumination.
5. Verification - This is the point where your idea is tested. Young (1975, p.52) states this stage could be: "...called the cold grey dawn of the morning after...[where] you have to take your little new-born idea out into the world of reality."

Young has made explicit the approach most, if not all, creative people generally adopt in developing ideas (Critchley 2007). It is Young's (1975) assertion that an idea is a combination of old elements, which is central to the argument for a holistic perspective of UXD. The more we as researchers and designers look at the

diverse examples of UXD the more elements (knowledge, understanding etc.) we acquire and the more relationships (combinations of elements) we can develop. By stipulating UXD as our holistic domain, we are able to maintain cohesion between our initial all-inclusive viewpoint and the increasingly finer grained concerns we focus in on as our reflection/research progresses, for example pedagogy, technical, organisational and socio-cultural research themes as identified by Conole and Oliver (2007b).

More than pedagogy – concern for UXD in games and other domains

In their framework, Conole and Oliver (2007b, p.13) position interest in games under a concern for pedagogy. I suggest that by doing so potentially limits our research into what Conole and Oliver (2007b, p.13) identify as an “exploration of the impact of new technologies.” An immediate focus on pedagogy may fail to observe wider contributions to UXD such as those that potentially relate to motivation or emotion. After all, Hughes (2000) reminded us that multimedia is an emotional medium. In games design, emotion is a current focus of attention by such designers as Peter Molyneux and Lionhead Studios, who in their forthcoming role-playing game ‘Fable 2’ explore the concept of empathy, love and companionship as a central element of the game-play experience.

What motivates a learner is an obvious concern for educators. For example Jonassen (1998) suggested that learners need to be perturbed by a problem for it to be appealing and engaging and is critical to learner buy-in. In the artefact reviews (see element 2 of the supporting creative work) the concept of task relevancy was highlighted as a particular concern for motivating adult learners (Lieb 1991; Bill 1997). It is interesting to note that Jonassen’s (1998) notion that learners need to be perturbed is akin to Schon’s (1987a) concept of ‘surprise’ which is at the heart of reflection in-action, a key aspect of Schon’s (1987a) practicum. (See also ‘Reflection and the practicum’ p.26.) A further example of motivation is highlighted by Clark and Mayer’s (2008) ‘Personalisation Principles’ discussed later in this chapter. These are but three simple examples of an area of concern that is a thesis topic in its own right.

An initial holistic consideration of UXD in games affords us the opportunity to explore for example a user's experience of what is termed deep game play, a concept based on Csikszentmihalyi’s (1988) flow state. Csikszentmihalyi (1988, p.3) asserted: “Scholars in a variety of disciplines have found the concept of an optimal state of experience theoretically useful.” Flow State provides us with a way of understanding what draws a user's interest to, and holds their attention on, a

game. As such Flow State is an optimal experience one which users find deeply exhilarating (Salen and Zimmerman 2004).

A further concept of engagement (motivation) expressed in games design literature is the concept of 'Grokking'.

Grok is a really useful word. Robert Heinlein coined it in his novel *Stranger in a Strange Land*. It means that you understand something so thoroughly that you have become one with it and even love it. It's a profound understanding beyond intuition or empathy (through those are required steps on the way). (Koster 2005, p.28)

Discussing the basis of grokking, Koster (2005) observes that some cognitive researchers consider three levels of brain function. The first, deals with conscious thought; the second is integrative, associative and intuitive, which is the part of the brain that packages things into chunks. This part of the brain cannot be accessed directly, it is the source of common sense, and can be frequently wrong. It is the aspect of the brain that constructs approximations of reality. The third level of brain function is what we understand to be 'muscle memory' but is the: "part of your body that works based on the autonomic nervous system" Koster (2005, p.30). While the description 'muscle memory' suggests that the knowing exists in the muscle, this is not the case. Koster (2005, p.32) points out that in learning to play guitar chords: "Studies have shown that you don't even have to do it physically. You can just think about doing it and it'll get you much of the way there. This is strong evidence that the brain is doing the work and not the muscle."

The concept of game-based goals is yet another example which came out of the consideration of game design, and is drawn upon in the practice-based aspect of this research. See also 'Margaret's secret, the Easter eggs and goals' p.129.

Game design is but one domain that a holistic concern for UXD allows us to draw upon. Theatre is another example. Laurel (1993b) suggested that theatre is a promising foundation for thinking about human-computer interaction. "Unlike a strictly scientific approach, the notion of designed experience leads to a design discipline in which ideas like pleasure and engagement are not only appropriate but attainable" (Laurel 1993b, p.xix). Models of the interface, the role of drama as a foundation of structure, action and human engagement are all themes of Laurel's (1993b) book entitled 'Computers as theatre'.

When designing TSL, a holistic perspective of UXD makes these and other theories, models and principles accessible. It is worth noting also that a holistic perspective of UXD mirrors the emergent paradigm of learning design and its emphasis on the learner and learning activity over a primary concern for content (a criticism of the early use of VLEs and learning objects) in so much as both advocate the need to step back from finer granular concerns and consider the wider context.

Tied to the holistic perspective of UXD is the project starting point, see – ‘The starting point - a grounded approach’ later in this chapter; and the critique of other artefacts see – ‘Artefact review - the role of the critique’ also later in this chapter.

The design and realisation of TSL – a multi- and inter-disciplinary endeavour

Knowing what technology is available as well as knowledge about teaching and the topic (subject matter) being taught is vital to good course design (Sharpe and Oliver 2007). The role of the teacher (practitioner) in the design for learning is essential; it is the knowledge of both the subject matter and wider learning and teaching (pedagogy) that makes their participation key to the TSL design process. However, the design of TSL is complex, requiring many fields of expertise (Duffy and Kirkley 2002; Schlusmans *et al.* 2004). “It is too much to leave the process to one teacher. Developing integrated e-learning courses requires teamwork, to which the experts each bring their own field of expertise” (Schlusmans *et al.* 2004, p.137). The areas of expertise Schlusmans *et al.* (2004) suggested include:

- Project management
- Instructional design
- Subject matter expertise
- Content management
- Editing
- Developmental testing
- Publishing
- Data entry
- Graphic design
- Media technology.

The areas of expertise outlined above are similar to those established by the ‘distance learning group’ (DLG), a division within Abbey National PLC in the mid-1990s. See ‘element 1 - TSL artefact outline project cycle and skills audit’ as part of

the accompanying supporting creative work. The DLG was made up of twelve permanent members of staff who worked on projects in small teams of 3-4 alongside a departmental subject matter expert (SME) (for example, a pensions expert) to develop and realise TSL material. Within this training context concern for pedagogy (role of the practitioner (teacher) / SME as is the case with Schlusmans *et al.* (2004) example above) was the responsibility of the analyst, whose skills and knowledge requirements included an understanding of cognitive psychology.

Multimedia material developed in a commercial domain is frequently produced in what could be described as a cottage industry with small development teams, where the ideal team member is multi-skilled and project leadership is viewed as a common property passed to the most appropriate team member as a situation requires (Hughes 2000). (See 'Reflection on this review' p.66 for a consideration of the significance of such a shift in leadership as it relates to this project.)

In the development of TSL, Schlusmans *et al.* (2004, p.129) pointed out: "Although some people combine several fields of expertise, it is unlikely that any one person will combine them all." Even so, Masterman and Vogel (2007) suggest that we should avoid a division of labour between those who 'author' and those who 'realise' TSL asserting that:

...the iterative design of learning activities can promote the advancement of teachers' own knowledge [in a subject area]. Thus although both authoring and realisation of learning activities can be construed as creative acts it is essential to afford teachers the same constructivist opportunities we value for learners... (Masterman and Vogel 2007, p.62)

While such a view is an ideal, and may be sustainable for teachers who are technology centric (such as those working in IT departments, or someone like myself who teaches interactive media), the reality is that for most teachers, a division of labour exists by virtue of the complexity of technological know-how required to develop some types of TSL experiences.

VLEs have to some extent been used to help bridge the divide between the teacher (author / SME / pedagogy expert) and realisation of TSL. (See 'VLEs, learning objects and toolkits' earlier in this chapter). However the establishment of instructional designers/e-learning developer posts in institutions, whilst facilitating the realisation of TSL artefacts, also promotes a division of labour. Seale *et al.* (2007, p.124) suggested: "Design for learning makes explicit the false

dichotomy between teachers and learning designers on the one hand and learners on the other. In learning to learn the learner must become the designer of learning; and in designing of learning the designer must, equally, be a learner.”

The empowerment of teachers (practitioners) to utilise TSL opportunities is a distinct TSL research theme. The utilisation of TSL takes different forms. For example, in their book ‘Rethinking pedagogy for a digital age’, Beetham and Sharpe (2007b) drew together the work of various researchers and practitioners, and focused on ‘learning design’ as a means of supporting practitioners (teachers) to make better informed decisions with regard to choice, use, adaptation and integration of pre-existing pedagogically useful TSL artefacts in order to provide a coherent learning experience. The book does not tackle how one designs a ‘pedagogically useful’ TSL artefact.

In discussing design for learning, Seale *et al.* (2007) suggested that while there are well-understood conventions for the design of print-based technology, learning technology designers do not always have an equivalent level of understanding for material in the digital domain. Furthermore Seale *et al.* (2007) suggested that the creation of TSL is not merely mechanical process it requires technical, pedagogical and creative competencies.

Thus far this literature review has highlighted that TSL research (and by inference evaluation) as well as the design and realisation of artefacts are multi- and inter-disciplinary concerns requiring a diverse range of expertise.

The next section in this review considers where one should start in the TSL design process. Beetham (2007, p.34) asserted: “As designers of learning, we need to make choices about technologies in a way that takes account both of how they support the learning task and of how they will be experienced by individual learners - the different ‘possible relationships’ between task and learner that they might mediate.”

The starting point – a grounded approach

Within the context of TSL, Cook *et al.* (2007, p.68) pointed to the findings of a workshop entitled ‘Realising the Potential of E-learning’ held in 2003, which identified a key research issue: “Understanding the needs of learners both inside and outside formal learning environments and methods for capturing their achievements.” Cook *et al.* (2007, p.68) went on to suggest that: “Research to

address this type of issue would clearly be interdisciplinary and would need to employ the human-centred approach...”

In developing a discourse around the underlying learning processes within e-learning, Ravenscroft (2003a, para. 17) argued that: “We [researchers, practitioners and administrators] need to work collaboratively, using action research type approaches - including all relevant stake holders”.

As already stated in chapter 1, this multi- and inter-disciplinary practice-based project takes an action research approach. In chapter 6 this approach is discussed in detail, however it is worth mentioning here, within the context of the starting point of the practice-based aspect of this research, that a key characteristic of action research is an initial reflection on/in practice.

As a starting point for the development of TSL, Laurillard (2002, p. 179) suggested: “The design of learning materials for any medium should begin with the definition of objectives and analysis of student learning needs.”

From a product-based UXD perspective, the desire to have a multipurpose artefact is compelling especially in a commercial context where size of audience and number of sales form the basis of the economic viability of an artefact’s development. This could possibly be one of the drivers for what Mayes and de Freitas (2004) observed as a pragmatic focus of the implementation of TSL, one which I would suggest also in part feeds interest in the reusability of ‘learning objects’. (See also ‘VLEs, learning objects and toolkits’ earlier in this chapter.) Perfetti (2001, para.2) observed: “...by trying to satisfy the needs of all users, designers often fail to satisfy the needs of any one user.” To address this problem Perfetti (2001) described the use of ‘personas’, a concept developed by Cooper Interaction Design. In establishing a user-centric design, a sample of the intended users are profiled, and based on their common goals, grouped into several clearly defined ‘personas’. The design process then focuses exclusively on satisfying the goals of one or two of the ‘personas’ (Tidwell 2006; Cooper and Reimann 2003; Brown 2006).

Whilst Laurillard’s (2002) suggestion to focus on learning objectives provides an initial starting point for the development of TSL, a further review of literature details several other important and interconnected aspects of learning and teaching activity which also need to be taken in consideration.

Jonassen (1998) pointed to our need to have a deep understanding of the fields of study (subject matter) being taught:

...you must analyse the activity structures required to solve the problems and identify processes that need to be represented visually and how the learner needs to manipulate those images in order to test their models of the phenomena. ...examine the field of study, not for its topics (as in a text book) but for what practitioners do. You only need ask experienced practitioners to describe cases, situations, or problems that they have solved. (Jonassen 1998, p.220)

Understanding the student (user) is also a key aspect and focus shared across product-centric UXD irrespective of whether the artefact is learning or non-learning focused.

Increasing participation in Higher Education (see chapter 1 'UK national context' p.13) has brought about new challenges for teaching and learning. Laurillard (2002, p.25) observed that the increase in student numbers in HE has meant: "...the likelihood that students will not have fully mastered all the prerequisite ideas in a subject area... It will continue to be necessary, therefore, for academics to understand not only where students should get to, but also where they are as they begin a course." In considering the characteristics of learners Ravenscroft (2004) in Dyke *et al.* (2007, p.89) asserted: "Learners are not tabula rasa and they are all different. So the knowledge and processes they bring to an educational interaction has a significant bearing in what and how they learn from these interchanges."

Both Wilson (1999) and Laurillard (2002) drew attention to a need to consider the wider context of the learning environment. Wilson (1999, p.6) said: "I believe that instructional quality cannot be determined by adherence to a particular method or strategy. Quality or effectiveness has as much to do with relationships, contexts, and situations, as it does with method". Laurillard (2002, pp. 208-209) pointed out that: "The most stunning educational materials ever developed will fail to teach if the context of delivery fails. The 'context of delivery' encompasses the support system needed to help students achieve the maximum benefit from their study."

A grounded approach requires us to seek to understand the student, their characteristics. It requires us to reflect on and be clear about the learning objectives, the learning environment and the field of study (subject matter being taught). The grounded approach is all important in determining a TSL response. As such a consideration of the aspects which make up the grounded approach (learning and teaching within a given context) are what determines the other

cognate fields and disciplines upon which UXD draws. For example a learning situation that seeks to develop a student's understanding of the relationship between ambient environmental temperature within the context of the kiln firing times of ceramic ware, may draw upon virtual product or virtual lab based computer simulations, whilst a learning situation concerned with the chronology of artistic movements may draw more heavily on information architecture/design.

Laurillard (2002, p. 197) stated: "There is no simple perspective rule connecting the analysis of learning activities to the required medium. However the elaboration of what the teaching is trying to achieve, and how, will inform the media selection by clarifying which learning activities are most likely to need support."

It is worth noting here that the grounded approach is in harmony with a post-theoretical perspective of learning and teaching (a perspective this project has adopted along with a grounded approach). In reflecting on the characteristics of a grounded approach, Land and Hannafin (2000, p.3) pointed out: It does not advocate or presume the inherent superiority of a specific epistemology or methodology for design. Rather, grounded design provides a framework for reconciling diverse design practices with the basic tenets of the associated belief systems."

Chapter 3 documents the needs and task analysis undertaken as a means of better understanding the students, learning situation / environment and subject matter as it relates to the three-hour studio-based practice session that is the learning and teaching context of this project investigation. Chapter 4 considers the information gathered and insights gleaned from this literature review as well as the artefact reviews (see element 2 of the supporting creative work attached to the back of this thesis) and proposes the construct type and objectives of the TSL artefact.

Artefact review – the role of the critique

The purpose of this next section is to present a rationale for the role of the 'artefact critique' in the design of TSL artefacts.

An essential aspect of art and design pedagogy is the process of interpreting and understanding the significance of aesthetics and other experiences (Harding and Ingraham 2007). This is driven by the artefactual critique and is a central tenet of all art and design disciplines (Poggenpohl 1993; Lackney 1999; Swan 2002; Bolt 2006; Drew 2007; Harding and Ingraham 2007).

The critique is a process of reflection on an experience or what Harding and Ingraham (2007) term 'reading an object' and can be a means by which we better understand our experience of an artefact (object).

In considering the aesthetics of learning and teaching, Harding and Ingraham (2007) drew a parallel between the characteristics of the role of an artist and that of a teacher, observing that in the creation of an artefact by an artist and the design of a learning experience by a teacher both seek to invoke reflection by their respective audience. Harding and Ingraham (2007, p.142) went on to suggest that: "...both the methods of creating and interpreting aesthetic experiences are relevant to understanding how to design for learning not only for the arts, but for many disciplines." Boyle's (2002) focus on the 'interactional layer' as mentioned earlier in this chapter, supports this suggestion in so much as it is the design of the user experience within a given context which is of primary concern.

Drawing on discussions from a 2006 Higher Education Academy symposium entitled 'e-learning in the disciplines' Harding and Ingraham (2007) in feedback discussions with arts, maths and social science practitioners observed:

... an emphasis on the process of thinking about a problem (of questioning) in the arts as compared with an emphasis on resolving problems, finding solutions (answers) in some other disciplines. It is this focus on the activity of questioning that is the key to the disciplines of the arts and, accordingly to designing for learning in those disciplines. (Harding and Ingraham 2007, p.144)

I would suggest that this 'questioning' aspect of art and design practice infers a desire to 'understand', a characteristic which is also shared by the post-theoretical perspective of learning. Oliver *et al.* (2007, p.28) suggested that in communities of practice that adopt a post-theoretical perspective "...emphasis is on understanding rather than 'truth'".

As I have outlined earlier in this chapter UXD (of which TSL is an aspect) is a complex multi-dimensional interconnected overarching concern for user experience. This concern has a wide range of perspectives across a vast array of disciplines. From a TSL designer perspective, it begs the question: 'Where does one look for clarity in such complexity?' There is no simple answer. Some have turned to theory and by association a focus on 'truth' (an inference one can make based on the quotation from Oliver *et al.* (2007) in the preceding paragraph). I would suggest that clarity comes out of understanding. A TSL artefact is the embodiment of the theories, models and principles upon which its design, construction and delivery

draws. A critical review of other peoples TSL artefacts affords us the opportunity to reflect on, not only their choice of theories, models and principles but more importantly, via first hand experience, we are able to observe and reflect upon how each succeeds or fails within the interconnected complexity of a living artefact. From a slightly different perspective, the critique of ones own work by a third party can yield further benefits by potentially helping to tease out the tacit knowledge we have brought to a given TSL artefact design. I would therefore argue that by engaging in critical reviews of TSL artefacts, we are afforded the opportunity to at least remind ourselves of, and at best, advance our own understanding of UXD. In the context of theoretical research, is this not at least in part, the purpose of a review of textual literature?

Later in this chapter I discuss simulations; however it is worth noting here Aldrich's (2003) view on how we can begin to understand them.

If you want to understand simulations the only way to do it is to become familiar with today's computer games. Games are not educational simulators, of course. But they can introduce you to the structures, standards and techniques built into simulations today. (Aldrich 2003, p.14)

The artefact reviews undertaken as part of this project's on-going consideration of UXD in TSL within the practice-based aspect of this research, were incredibly useful. Having a better understanding of the specific needs and requirements through the grounded approach (as outlined earlier in this chapter) afforded the opportunity to consider these within the wider domain of published and public domain artefacts as well as the available textual literature. While there were no artefacts that afforded the opportunity for direct comparison, i.e. there were no examples of SRIT skills artefacts, having a clearer understanding of the needs and requirements enabled an identification of artefacts that sought to address and support similar requirements.

The reviews were significant in that they highlighted a wide range of UXD concerns as well as opportunities. The opportunities afforded a mix of computer-based and non-computer-based media. The consideration of authentic simulations (discussed later in this chapter) led to the consideration of Situation Awareness (SA) (also discussed later in this chapter). Within current TSL literature there is no reference to this emergent theoretical field. As such it is interesting to note that it was the artefact review which was the conduit for highlighting the existence of SA as a cognate domain worth considering in the context of this project. The artefact reviews in essence helped to provide an expanded road map for the further

consideration of theories, models and principles within the complex landscape of UXD.

The artefact reviews are provided in the supporting creative work attached to the back of this thesis, see element 2, p.257.

Emerging within the practice-based grounded approach

What follows in this next section is a collection of some of the theories, models and principles that either emerged from, or were highlighted by, the grounded approach taken by this project.

Simulations

A consideration of simulation came to the fore while considering which artefacts to review as part of the background research.

The use of simulators in education is well established. In my own teaching practice for example, I used 'SimCity' by Wright and Haslam (1989) in 1992 with FE art and design students studying a business studies module.

Simulations can enhance learning. Bill (1997) points to the findings of a pilot evaluation of simulated experiments in engineering that documented a substantial gain in students' retention of subject matter using computer simulation in conjunction with classroom-based activities (blended learning) over conventional teaching methods. The use of simulators to enhance learning is supported also by Garris *et al.* (2002, p.55), who made reference to the observation made by Gopher *et al.* (1994) that spending ten hours using an aviation computer game led to significant performance improvement for military flight school trainees. Whiteley and Faria (1998) have also found that the performance of marketing students on quantitative tasks was enhanced over students who did not use the simulator.

Schmucker (1999) presented a broader role for the simulator:

Simulations provide a unique environment for exploring new concepts, for gaining an understanding of the interplay between related complex phenomena, and for the construction of simplified working models of topics under study. Simulations are also one area in which computing technology is uniquely suited as a delivery mechanism for an educational experience. (Schmucker 1999, p.1)

Simulation is complex area with a host of perspectives. For example, see chapter 6 'Simulation evaluation issues' for a consideration of differencing perspectives within the context of the evaluation of simulators.

In reflecting on his work with designers, implementers, customers and associates, Aldrich (2005, p. xxvi) observed: "most people had different and often conflicting views of educational simulations." Cook *et al.* (2007, p.59) pointed out: "Simulations may take many forms, such as scenario-based simulations, knowledge- or model-based simulations or multi-platform, multi-user synthetic environments enabling cooperative and adaptive immersion learning."

Aldrich (2005) identified four computer-based simulator genres dominant in corporate and HE today - 'branching stories', 'interactive spreadsheets', 'game-based models' and 'virtual labs/virtual products'. Branching stories follow a sequence or time-line with multiple choice decisions needed to be made along the way, which lead to various outcomes. Interactive spreadsheets are used to explore abstract business type issues and are often multi-player/team-based promoting shared understandings. These types of simulators are often teacher/instructor facilitated. Aldrich (2005) pointed out that the goal of game-based models is to make learning fun. These models are more diagnostic than instructional and are appealing to educators because their use promotes high levels of user satisfaction. Virtual products and labs focus on the manipulation of selective representation of different types of equipment or products outside of the physical constraints of the real world. Each of these simulator genres is valid and effective and important within an educational context (Aldrich 2005) but as Aldrich also pointed out:

Each works. But they are very different, with often opposite strengths and weaknesses, and therefore have different roles. They are far from interchangeable, expecting one, and getting another, can cripple a learning programme. (Aldrich 2005, p.6)

Referring to computer-based simulation research carried out by a number of researchers in the early 1990s, Cook (2002) observed that the findings of these projects showed that in acquiring explanatory accounts of the real world: "...students may fail to generate deep causal models of the behaviour under simulation because they concentrate on manipulating the simulation objects" (Cook 2002, p.4). In contrast Clark (2006) asserted that educational simulators offer a better transfer of learning to the 'real-world' over other forms of delivery. Whilst these opposing views illustrate Aldrich's (2005) observations of conflict within the field, I would suggest that the stark contradiction could point to a possible

difficulty the researchers in the early 1990s had with respect to the choice of simulation type.

From the four basic simulator genres Aldrich (2005 p.60) offered a more detailed view of educational simulators by considering what he terms: “the two most relevant, non-correlating pairs of technology dichotomies”. These are stand-alone versus instructor and linear versus dynamic content. From these Aldrich (2005) mapped out educational simulations within four tangential spaces (quadrants).

Figure 5 Aldrich's (2005) Educational simulations and tangential spaces

Of the four quadrants, ‘dynamic instructor-supported’, ‘linear instructor-supported’, ‘linear stand-alone’ and ‘dynamic stand-alone’, it was the ‘dynamic stand-alone’ model of simulators which was considered to be the holy grail of early educational simulation designers (Aldrich 2005). However Aldrich (2005, p.69) pointed out: “Each has inherent value. They all work, and each simulation model has attributes we will have to consider in the context of next generation simulators”.

Given the diversity of types of simulation, it is essential to understand the objective of the TSL experience. (See ‘The starting point - a grounded approach’ earlier in this chapter. See also chapter 4 - ‘The scale and scope of the simulator - (SRIT content)’ p. 109 for an outline of the TSL artefact aims and objectives.)

Both the choice and design of the simulation need to be in harmony with the learning objective. (See chapter 4, 'Situation awareness, simulator - facilitating practice' p.105 for a discussion of this within the context of the practice-based aspect of this research project.) "One of the defining aspects of simulations (and computer games have explored this area in full force) is the concept of dynamic skills" (Aldrich 2005, p.70). It is this concept which is considered next.

Situation awareness and SRIT – 'dynamic skills'

As a result of the reflection on the characteristics of SRIT skills in chapter 3 and significantly the critique of the flight simulator artefact (see element 2 of the supporting creative work) an area of research previously not encountered in the review of literature was highlighted, 'Situation Awareness' (SA) theory.

Developed initially within the field of avionics, SA is an emerging area of study within human factors research (Endsley 2000b). SA theory is concerned with human decision-making and performance in complex dynamic situations. SA is based on three cognate levels: level 1 perception; level 2, comprehension and level 3, projection (Endsley *et al.* 2003). They can all be found within a dynamic environment such as flying an aircraft. (A further example of a dynamic environment within the context of this project is represented by the grey area on the 'summary table of SRIT tasks' Figure 24 p.100.) Within such an environment, SA is attained utilising our full range of senses to recognise and process cues. "Cues may be received through visual, aural, tactile, and olfactory or taste receptors. Some cues may be overt (e.g. a system alarm) and some so subtle that they are registered only subconsciously (e.g. the slight change in the hum of an engine)" (Endsley 2000c, p.10).

SA cues exist in what Kolb (1984), in his structural dimensions of experiential learning (see Figure 2, p.26), termed concrete experience. Endsley *et al.* (2003) observed that SA level 3 perception is attained through a high degree of experience. This high degree of experience is what Gage and Berliner (1998) refer to as 'over learning'.

By simply practising over and over a skill such as piano playing, chess, or even remembering strings of random numbers, people do get better at that skill. Poor musicians get good, modest chess players get to play in tournaments, and people with limited memories develop excellent memories, by over learning -- practising well beyond basic mastery. (Ericsson 1996 as cited in Gage & Berliner 1998, p.264)

SA is achieved through the deployment of various mechanisms that support an individual's cognitive performance such as schemata or goal-directed processing. Via these mechanisms through experience and training SA is developed (Endsley *et al.* 2003).

As discussed in chapter 3 (see 'SRIT and practical skills' p.99), a key aspect of SRIT is the ability to perceive, comprehend and predict and, as a consequence, respond accordingly over time to a range of constantly changing factors within a dynamic environment/situation. Aspects of SRIT linked to SA are illustrated in chapter 3, Figure 24, p.100.

SA is helpful in that it makes easier our understanding of the dynamics of SRIT skills within a cognitive framework. For a further consideration of SA see chapter 4 'Situation awareness, simulator - facilitating practice' p.105. See also: chapter 6 'Measuring situation awareness' p.145 and chapter 8 'SA and SRIT' p.181.

Modality

In discussing modalities and channels, Cook *et al.* (2007, p.59) suggested that: "Being aware and taking account of these issues is important in effectively designing for learning." It is important to note that where consideration of modality has occurred as part of the practice-based aspect of this project, it is documented in the context of the actual practice as outlined elsewhere in this thesis and accompanying supporting creative works.

Modality is the human interaction upon which SA is built. Modality is a concern for the five human senses of taste, touch, smell, hearing and vision and is a very wide area of study across numerous fields such as medicine, humanities, linguistics, science and technology. Each mode (human sense) has many channels of perception; for example, visual modality includes the perception of colour, light, text, pictures etc.

Modal density

One of the aspects of modality of interest to this project is modal density. Norris (2004, p.150) suggested modal density is "the intensity or complexity of modes that an individual in interaction employs to construct a high-level action". Within the practice-based aspect of this project, a consideration of the various modes (aural, visual and tactile) and their position (density) across the timeline of an interview

was contemplated as part of the task analysis of SRIT the results of which are illustrated in Figure 24, chapter 3 'Needs and task analysis' p.100.

Multi-modal interaction

The aspects of modality that have particular relevance to TSL are those concerned with multi-modal human-computer interaction. Within these aspects of modality there are further foci of attention, for example cognitive load and channels of perception afforded by different media such as sound, static and moving images etc. (See 'Clark and Mayer (2008) Modality Principle - text and images' for a consideration of this aspect of modality later in this chapter.) Another aspect of modality of interest to TSL relates to the physical interaction (input/output mechanisms) between human and computer.

Within the context of this project, consideration is given to input mechanisms in chapter 4 p.108, 'Where and how the simulator (artefact) would be used'. While the keyboard and mouse are the most prevalent method of interacting with computer systems, Oviatt (1999, p.75) asserts that as an input mechanism "... keyboard and mouse input are relatively limited and impoverished, especially when interacting with virtual environments, animated characters and the like". (For a consideration of alternative types of input mechanisms see p.285 'Interaction and input mechanisms' - element 2 of the supporting creative work.)

An interesting side point worth noting here is Oviatt's (1999, p.75) suggestion that: "...multimodal systems can flourish only through multi-disciplinary cooperation as well as through teamwork among those with expertise in individual component technologies". This supports the earlier discussion in this chapter about the multi- and inter-disciplinary nature of the design and realisation of TSL.

Clark and Mayer (2008) Modality Principle – text and images

When explaining on-screen graphics to a user, Clark and Mayer (2008, p.99) argued that reducing the demands on visual processing by replacing the on-screen explanatory text with audio narration, generates significant learning gains. The basis for this argument is founded on the principle that people have separate information processing channels for visual/pictorial and auditory/ verbal processing.

When a learner is given concurrent graphics and on-screen text, both must be initially processed in the visual/pictorial channel. The capacity of each channel is limited, so the graphics and their explanatory on-screen text must compete for the same visual attention. Clark and Mayer (2008, pp.205-206)

Replacing on-screen text with narration spreads the processing load between auditory and visual channels. While Clark and Mayer's (2008) 'modality principle' is based on the concurrent presentation of graphics and the replacement of related descriptive on-screen text with narration, the basis of the principle can be applied to a concurrent presentation of on-screen text and narration (without graphics). This type of presentation also spreads the cognitive load between auditory and visual channels. Clark and Mayer (2008) pointed out that such an approach can also enhance information processing. (See also p.284 'Text and Narration' element 2 of the supporting creative work for a further discussion of narrated text.)

Personalisation Principles

"The personalisation principle is particularly important for the design of pedagogical agents - on-screen characters who help guide the learning processes during an instructional episode" (Clark and Mayer 2008, p.157).

Conversational v formal style

A conversational style applied to on-screen text and or narration enhances learning (Clark and Mayer 2008). This is not to say that one needs to disregard the use of formal language. By adopting a 'second person' writing style formal language can be presented in a way that helps to create a conversational tone. "Expressing information in a conversational style can be a way to prime appropriate cognitive processing in the learner" (Clark and Mayer 2008, p.162). It is the triggering of social cues in the conversational style that increases active cognitive processing which in turn can lead to an increase in the quality of learning outcome. Research carried out by Wang *et al.* (2006 in Clark and Mayer 2008) indicated that the use of 'polite speech' results in learning gains. Furthermore considering the work of Brown and Levinson (1987) with regard to politeness theory, Clark and Mayer (2008, p.167) pointed out: "...alternative [polite] wordings help to save face - by allowing the learner to have some freedom of action or by allowing the learner to work co-operatively with the agent".

Make the author visible

An extension of the conversational style is the process of making the author visible to the learner to promote learning. Exposing the author to the learner gives a voice to the text used in the learning material and promotes learner motivation (Clark and Mayer 2008). Paxton (2002, p.202) suggested: "A human-to-human relationship between author and reader is encouraged by the presence of a visible author." The difference between author (tutor) presence and non-presence was an

aspect highlighted in the artefact reviews. (See 'Tutor role and representation' p.285 element 2 of the supporting creative work.)

Reflection on this review

Scope of the review

This review has sought to highlight a number of the cognate domains and associated theories, models and principles upon which the practice-based aspect of this project initially drew as well as others that have emerged out of a reflection on and in practice (a characteristic of the post-theoretical, grounded, action research approach taken by this project) and by revisiting both existing and new literature available towards the end of this project.

However, defining what cognate domains and their associated theories, models and principles inform the design of TSL is not always easy to articulate. Beetham (2007, p 37) suggested: "...good design does not always move in a linear fashion from theory to principle to practice. It can evolve from a range of practical examples without ever being formally articulated, ... remaining a kind of shared expertise, or theory in use." This review has not attempted to articulate all the theories, models and principles that are or are not relevant to TSL, after all to do so, as Oliver (2002a) suggested, would be premature. It is clear that TSL is incredibly complex, spanning many disciplines and fields of study.

As such this literature review has sought to outline aspects of some of the cognate domains upon which this research has drawn in the wider context of TSL research. In chapter 1, I presented an illustration (see Figure 1 p.21) of how this project was framed within various cognate domains. While it is possible to generalise about some of the cognate domains we would expect to draw upon in the design and evaluation of TSL (for example, educational psychology and interaction design) some of the cognate domains are, in part, determined by the nature of the TSL artefact which in turn is informed by the audience, subject matter and learning context / environment (grounded approach). Ravenscroft and Cook (2007, p.213) pointed out that learning occurs within the dynamic interaction between people, tools and the wider communities of practice, asserting: "...learning design can not be separated from interaction design, accepting that interaction is by its very nature contextualised and therefore difficult to design, store and 'reuse'". The cognate domains illustrated in Figure 1 p.21 are specific to the characteristics of this project.

Emerging from new literature is the acceptance of a more general stance towards learning theories such as Mayes and de Freitas's (2004) three perspectives of learning theory (see 'Borrowing theories - part 1 (learning and teaching)' p.36). A stance further embodied is the post-theoretical perspective, which shifts the focus of attention away from the pursuit of truth to the pursuit of understanding (Oliver *et al.* 2007).

This review has outlined several learning theories linked to the art and design subject, but given that this project adopts a post-theoretical perspective which accepts all learning theory as valid interpretations of aspects of learning, a conscious decision was made not to attempt to articulate this vast landscape of theories and sub-theories. Such taxonomies, chronologies and critiques can be found in the work of others such as: Gage and Berliner (1998) - educational psychology; Bigge and Shermis (1992) - learning theories for teachers; Hill (1997) - survey of psychosocial interpretations of learning; Laurillard (2002) - critique of situated learning; Fowler and Mayes (2004) - mapping of theory to practice; Mayes and de Freitas (2004) - three perspectives of learning theory and Conole *et al.* (2007) - taxonomy of learning activities. Where specific learning theories have been considered, which after all are just different levels of aggregation (Mayes and de Freitas 2004), these theories are referred to in the context of this project's account of the practice. For example in chapter 5, see 'Margaret Weatherby, unpredictability, questions and answers' p.118, I draw on Skinner's (1974) concept of 'operant conditioning', which is typically viewed as an aspect of the behaviourist movement. While later in this chapter I draw on Schon's (1987a) practicum (see 'Reflection and the practicum' p.26 earlier in this chapter, and also see chapter 5 'User performance feedback' p.123.)

A trilogy of perspectives and roles

"Like other applied disciplines, it [pedagogy] is centrally concerned with how we understand practice (the 'evidence base' for theory), and how we apply that theoretical understanding in practice once again" (Beetham and Sharpe 2007b, p.3). However, Beetham and Sharpe (2007b) went on to point out that, as a field of study, these two central concerns (practice and theory) have been divided; teacher and researcher seldom have contact with one another.

As I stated at the start of this chapter, I undertook the literature review with three perspectives in mind – researcher, teacher (practitioner) and interaction designer. In doing so the review afforded me the opportunity to reflect on my own position

within the TSL community. It highlighted for me, amongst other things, the fact that in my own practice, I have not had to contend with issues that clearly exist for some researchers/teachers with regard to the conception of a TSL idea (design) and realisation of the TSL artefact. As a researcher, teacher and practising designer of interactive media, there has been no division of labour, no disconnect from my teaching practices when designing and implementing TSL-based learning activities. I am fortunate, in the context of my own teaching subject area, to be that 'unlikely' person Schlusmans *et al.* (2004) refer to (see 'The design and realisation of TSL – a multi- and inter-disciplinary endeavour' p.51).

From this privileged position, I have had the opportunity to reflect upon, through this review, my own perspective of the design of TSL, which has forced me to consider my own assumptions and tacit knowledge. The trilogy of perspectives I have adopted and their associated roles have been fluid across this review and this fluidity continues throughout the practice-based portion of this project in so much as leadership of various aspects of practice have been passed between the various roles. Such an approach mirrors Hughes' (2000) observations of the dynamics of multimedia teams (see 'The design and realisation of TSL – a multi- and inter-disciplinary endeavour' p.51). It is the teacher who has concern for pedagogy and sees the realities in the classroom and the value of a post-theoretical position with respect to the knowledge and learning; it is the researcher who seeks understanding, and acknowledges the multiple voices, the tension between institutional pragmatics and pedagogic concerns; and it is the designer whose interests lie in usability and the perspective from which I have been able to reflect on how all three perspectives co-exist as a shared concern for UXD. As such I have argued as part of this review that the design and evaluation of TSL is a multi- and inter-disciplinary endeavour requiring a holistic approach. The approach should be grounded in an understanding of the audience, subject matter and learning context/environment, upon which a comprehensive consideration and/or understanding of user experience design (UXD) is built, where theory informs rather than leads what we do as researchers, teachers and interaction designers. I have also argued that the artefact review is a helpful means by which we can better understand UXD.

Project framing and practice model

Finally it is worth noting that whilst Figure 1 p.21 helps to illustrate how this multi- and inter-disciplinary practice-based research project is framed with regard to various cognate domains, it is Garrett's (2003) model of user experience (see

Figure 4 p. 44) which provides the framework for the development of TSL. It is this model which is used in the practice-based aspect of this research (see chapter 5).

In the following chapter I document the implementation of the grounded approach as discussed in this chapter, and undertake a needs and task analysis of the learning and teaching activities, student cohort, subject matter.

Chapter 3 - Needs and task analysis

This chapter first describes the module DM1006 and defines the aspects of this module with which this research project is concerned. As part of the needs analysis, this chapter reflects upon the learning and teaching activities within the module and examines the module's student cohort. A task analysis looks at SRIT teaching practices at undergraduate level elsewhere within the UK and draws upon my own experience and the views of professional practitioners in the field to outline what constitutes SRIT in terms of 'practical skills' and 'skill acquisition'.

An outline of DM1006 and the research focus within the module

DM1006 was a level one module primarily offered for study across 12 degree pathways (courses) with diverse student cohort profiles.

Delivery of DM1006

More than 120 students registered on DM1006 over the course of a single academic year. DM1006 had a staff to student ratio of 1:20 and as such was delivered in a number of concurrent iterations in both semester one (September - January) and semester two (February - May) each academic year.

DM1006 overall module aim and learning outcomes

The aim of DM1006 was to introduce students to sound theory, audio recording techniques, digital audio technology and the composition of sound. This was achieved through 12 three-hour studio/classroom sessions (see Figure 6, p.71) and two practical learning/assessment-based activities.

Three types of learning outcomes were defined for the module: subject specific (SS), personal transferable skills (PTS) and generic academic outcomes (GAO) (see also appendix 1d module guide). The learning outcomes were:

1. Utilise digital audio recording and editing equipment to gather, organise and manipulate dialogue (SS)
2. Design and construct audio compositions using digital audio applications (SS)
3. Act independently (PTS)
4. Gather information (PTS)
5. Make(ing) and Design(ing): explore potential of media, materials and processes. (GAO)

The outcomes were contextualised (reworded) for the assessment sheet (see appendix 1b, 1c assessment criteria). This rewording was derived from six predefined assessment criteria appropriate for an art and design context (see module guide, appendix 1d).

Assignment tasks and assessment methods

DM1006 was delivered and assessed through two equally weighted elements (assignments). See Appendix 1a - Assignment Brief, also Appendix 1b - Element 1 Assessment Criteria and Appendix 1c - Element 2 Assessment Criteria. Both assignment tasks were given to students during the first session (week 1) of the module.

The framework or context for the first assignment (element 1) was a location-based recording of an un-scripted un-directed interview with a stranger. This situation facilitated a variety of sound-recording challenges, (supporting the primary aim of DM1006 and subject specific outcomes), while the process of interviewing supported the students' development of generic academic outcomes and personal transferable skills as outlined in the module guide (see appendix 1d Module Guide). Teaching and learning activities supporting the first assignment took place across weeks 1 to 7 (see Figure 6 below).

The second assignment spanned weeks 8 to 12 and was used to build upon and expand study to meet the full range of learning outcomes.

Figure 6. Weekly lesson schedule

Week	Taught Session Description	Independent Study
1	Module Induction. Introduction to Element 1, (Assignment 1)	Acquire consumable items, zip disks, batteries, and minidisk.
2	Lecture - Physics of Sound (Analogue and Digital).	Read articles and think about questions for the interview, bring in a sound to perform next week.
3	Sound performance. Characteristics of sound (timbre) Lecture - Conducting and Recording an Interview. Demonstrate Recording Equipment. Group exercise - Share Questions. Role-play - Interview.	Work on assignment task
4	Video Lecture - Microphones and Sound Recording Lecture - The Role of Transcripts Workshop and Digitising Equipment Demonstration	Work on assignment task
5	Video Lecture - Contemporary Example of Assignment Task. Software Demonstration and Practical Workshop	Work on assignment task
6	Individual Tutorials and Practical Workshop	Work on assignment task

7	Practical Workshop Submission of Element 1	Work on assignment task
8	Introduction to Element 2. (Assignment 2) Video Lecture - Contemporary Example of Assignment Task.	Work on assignment task
9	Lecture - Digital Sound in Digital Media Contemporary examples in film, Animation and Multimedia Individual Tutorials - Formative Feedback on Element 1 Practical Workshop	Work on assignment task
10	Lecture - Psycho acoustics, and MP3 Individual Tutorials - Formative Feedback on Element 1 Practical Workshop	Work on assignment task
11	Individual Tutorials and Practical Workshop	Work on assignment task
12	Submission of Element 2 - Feedback Q&A session	

Use of TSL in the module

In the delivery of DM1006 extensive use was made of a web-based repository. <http://www.jim.org.uk>. This repository held digital copies of the assignment briefs, assessment criteria, module guide, lecture presentations (PowerPoint); a streaming verbal audio introduction to the module; a learning object - 'Timbre', recording equipment manuals, a software manual, a number of sound-focused reference articles, hyper links to various sites and a host of exercise files used as part of studio-based workshop activities. These digital files, artefacts and documents were uploaded to the site as and when they were referred to, in each of the taught sessions on a week-by-week basis.

A focus on teaching week three

As stated in the introduction, this research project focuses on the activities centred on the learning and teaching that took place in and around week three of the module programme. (Refer to Figure 6, p.71 - Weekly lesson schedule). The skills to support the assignment-based activities were first introduced in week 3, which is also the point at which students began to undertake the first assignment. It is for this reason that only the first assignment and study weeks 1 through 7 are detailed here.

DM1006 learning and teaching activities weeks 1 to 7

Week 1

In week one both the module content and overall theme of "Hearing and Listening" were introduced. Students were provided with printed and digital (web-based) reference material including a digital module guide (see appendix 1d Module guide) and a printed copy of the first assignment and criteria upon which

the assignment work would be assessed. At this time students were instructed not to start to attempt the assignment until the end of week three.

Week 2

Week two consisted of a lecture-based session introducing the students to the basic properties of analogue and digital sound. For example, analogue sound expressed as a periodic waveform or sine wave, amplitude (loudness), frequency (pitch) and timbre, the transition from analogue to digital and the expression of digital sound in terms of sample rate and resolution. The material was presented through group and individual participatory demonstrations and lecture presentation. At the end of the taught session and as a part of their independent study (homework), students were instructed to read one or more articles that reiterate the material covered in the class. In addition students were given two further tasks. The first, to draw up a series of interview questions to ask an interviewee based on the subject of "What's it like to be a vegetarian?" The second task was to bring a 'sound' to the following week's class. This second task was deliberately obscure and was intended to provoke the student to think in a different way about the medium of sound.

Week 3

Week three was significant in the cycle of the module. Students wishing to change modules and transfer on to DM1006 had to do so by week three. This meant therefore there was no guarantee that students who joined the module in week three would access material covered in weeks one and two. Because of this, week three fulfilled a number of functions. The session was used to reinforce material covered in the first two weeks. It was also the point at which students were finally prepared to begin to undertake the first assignment.

During the week-three-session, students were first asked to play the sound they had been instructed to bring to the class the preceding week. This individual and later group performance of the sound was used to reinforce 'amplitude' and 'timbre' covered the previous week. To prepare students to undertake the assignment, a group exercise was used and each student was asked to share the questions they were instructed to prepare as part of their independent study. Each group was instructed to select five questions only and identify within the group one person who would undertake a role-play interview with the tutor using the group's selected questions. See appendix 2a - Week three taught session - group devised role-play questions.

Figure 7 Students devising interview questions for the role-play activity during the week three session.



While in groups, students were given a sound recording kit, which comprised a minidisk recorder and microphone. Basic instruction on the use of the kit was given to the students by means of a tutor-fronted demonstration.

After a period of time the class were brought back together. Each group's selected questions were mounted and displayed on the wall in the classroom. Time was given to compare question sets then the role-play was conducted with the identified student from each group and the tutor. The rest of the students were asked to observe the role play exchange. During the role-play the tutor introduced and illustrated a variety of possible scenarios. At the end of each role-play the group were encouraged to offer up observations or pass comment on the conduct of the interview. The tutor reinforced positive identification of issues raised by student observations and encouraged discussion about ways of resolving the issues. The tutor then recapped on the role-play and drew attention to any points missed by the group. Key issues illustrated and explored through the role-play fell into two groupings, the monitoring and control of the actual recording process and the interview process.

Recording and Monitoring:

- Equipment set up
- Microphone handling, placement and control
- Monitoring recording, background noise and voice levels.

Interviewing:

- Opening and closing the interview
- Listening skills
- Closed and open questions
- Double-barrelled questions
- Following up lines of questioning

- Body language
- Personal opinions, attitudes and controversy.

Figure 8 Tutor-Student role-play during week three session.



The session concluded with a lecture presentation covering health and safety considerations pertaining to the assignment activity, and reiteration of issues introduced during the role-play. Students were also referred to a number of publications for additional reading. They included 'Interviewing for Radio' (Beaman 2000) and Interviewing for Journalists (Clayton 1994).

At that time students were also reminded that they should then start the first assignment activity. Although the assessment process required the submission of a single edited interview, students were encouraged to conduct more than one interview to aid in their development and improve their performance.

Week 4

This session was used to extend the students' understanding of the characteristics and limitations of various types of microphones, further reinforce the need to monitor recording, the necessity of recording wild tracks (ambient background noise) to assist during the editing process, the introduction and purpose of interview transcription, and the introduction of the data transfer process from minidisk to computer.

Excerpts from two BBC training videos entitled On Camera (BBC Television Training 1991a) and The Language of Film - The sound track (BBC Television Training 1991b) were used as the primary means of introducing the characteristics (active and dead regions) of four basic microphone types, wild tracks and monitoring noise levels during recording. The second half of the session was taken up with tutor-led, small group demonstrations of the data transfer process and the role of the transcript as a creative and organisational tool. In addition the

demonstration provided both practical examples of the manipulation of physical resources and a tool that drew the students' attention to material covered in the earlier session relating to the characteristics of digital sound.

Week 5

Week five focused on the manipulation of the recorded interview and provided a further look at approaches to interviewing. The first activity was conducted through a lecturer-based demonstration of the audio manipulation software (Adobe Audition) and a workshop using sample sound files provided by the lecturer. Approaches to interviewing were examined through the presentation of two video excerpts. The first was from a recording of a BBC broadcast entitled 'Master Class, Making Documentaries - Molly Dineen' (BBC, 2000). Through the use of a peer-based question and answer session and excerpts of the film-maker's works, this programme covered a number of differing approaches to the 'interview' as a dynamic exchange and information gathering process. The second video took excerpts from two short films entitled 'War Story' and 'Creature Comforts' published on a compilation video/DVD entitled 'Aardman Classics' (Aardman Animation, 2000).

Week 6

In week six, the session was given over to the support of the completion of the first assignment and was arranged as both individual and small group tutor-supported workshops.

Week 7

Submission of the first assignment (Element 1) took place during week seven.

Independent study (homework)

Weekly sessions and associated activities were used to provide background information and context and to prepare the student to be able to complete the assignment. By virtue of the type of activity that the students needed to undertake in completing the first assignment (unscripted undirected recording with a stranger), much of this work was carried out outside of the class during the 7 hours weekly independent study time associated with the module.

Teaching concerns within DM1006

Prior to the commencement of this project there were two primary concerns I had with regard to the support of learning within the module. The first related to the limited number of sound kits available to use in class during the week-three-

session. This was problematic in that individual students did not have sufficient hands-on time in class to become familiar with the sound kits. The second issue related to supporting the students' introduction to SRIT. The nature of the first assignment task meant that most of the initial exposure to, and experience of SRIT by the students occurred, unsupported, outside class times. Other concerns such as limited opportunity for students to collaborate (beneficial when learning complex things (Brown *et al.* 1989)), were also identified through a reflection of some of the educational theory which underpinned DM1006 and the art and design practicum (see chapter 2 - 'Art and design pedagogy - educational theory' p.24). These concerns have been included in Figure 25 DM1006 Needs Analysis Summary, p.102 - module strengths and weaknesses, in the summary of this chapter.

A profile of DM1006 student cohort

Having taught DM1006 for several years, I had an evolved understanding of student behaviour and performance based on my own observations but also assumptions I had made during this time. Before I could reliably draw on this information, I felt it would be important to ensure that the observations and assumptions were reasonably accurate. To help establish a better picture of the students studying DM1006, a two-part survey was administered across the cohort of the semester 2 iterations of the module for the academic year 2002-2003 (see appendix 3a and 3b). Part one of the survey entitled 'Cohort Profile, Prior Experience and Module Expectation' was administered at the end of the first taught module session and recorded 49 respondents across the three iterations. The survey was administered after the students had been presented with, and briefed on, the first assignment task. Part two of the survey entitled 'Evaluation, Reflection, Practice and Resources' was administered across the three iterations at the start of week seven and returned 34 responses.

Prior experience

Part one of the survey sought to capture data pertaining to each respondent's prior or existing knowledge, experience and exposure to prior study, activities and recreational pursuits (formal, informal, active and passive) from which the student could possibly draw when undertaking the module study.

The survey indicated that 63.3% of respondents had not undertaken any media-based training or course that included sound recording. However, the same percentage (63.3%) indicated that they had used a microphone to record sound.

The results of the survey suggested that the sample cohort came to the module with a greater degree of informal knowledge and experience.

The viewing/listening habits of the respondents, and thus the degree of exposure to comparative interview-orientated media, varied across the types of programme and broadcast medium. Respondents were asked to indicate the degree of regularity with which they either listened to or viewed different types of interview-based broadcast programming (TV current affairs, TV chat shows, TV news, radio documentaries and dramas). With the exception of television news, which was viewed regularly by 59.2% of the respondents, the majority of the viewing and listening habits of the respondents fell into the 'occasionally' category. An occasional consumption pattern could be indicative of the nature of the relationship the respondents had with the various types of programme and broadcast medium. An 'occasional' response could be considered to be consistent with a passive relationship with the media, where possibly the content and not interest in types of programme or broadcast medium is the focus of interest. This view is consistent with my experience of the student cohort's weak contextual critical awareness of comparative media.

Figure 9. Cohort survey part one - Viewing and listening habits of module cohort.

	TV Current Affairs	TV Chat Shows	TV News	Radio Documentaries & Dramas
Never	26.5%	8.2%	0%	44.9%
Occasionally	69.4%	73.5%	40.8%	51.0%
Regularly	4.1%	18.4%	59.2%	4.1%

Student expectation

Furthermore, the survey sought to determine the respondents' attitudes to the first assignment. Within the survey, the assignment was described in terms of eight separate tasks. Respondents were asked to rank these tasks in order of perceived difficulty. It is important to note that a fixation with regards to software and technology skills were common amongst students within Digital Media. It was an ever-present challenge for teaching staff to realign students' perception of study and get them to look holistically at the range of elements which make-up the design-based digital media disciplines. The subject benchmark statement published by the Quality Assurance Agency for Higher education describes design as follows:

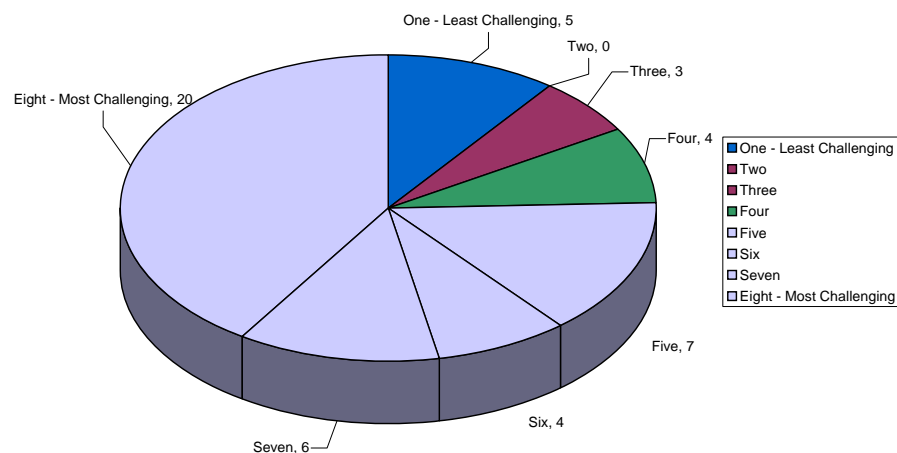
At its core, design involves both analysis and synthesis, and is frequently solution focused, culminating in the creation of design outcomes as prototypes, models or proposals. Design covers all aspects of decision making in relation to the aesthetic, operational, user, market, production and/or manufacturing characteristics of artefacts and systems. (Quality Assurance Agency for Higher Education, 2002, p.5)

The ranking exercise in the first survey was consistent with the students' fixation on software. 75.5% of respondents ranked using the software five or above (8 being the most challenging, 1 the least).

Figure 10 Cohort survey part one - Rank table for use of audio software.

		Frequency	Percent	Valid %	Cumulative Percent
Valid	1 = Least Challenging	5	10.2	10.2	10.2
	3	3	6.1	6.1	16.3
	4	4	8.2	8.2	24.5
	5	7	14.3	14.3	38.8
	6	4	8.2	8.2	46.9
	7	6	12.2	12.2	59.2
	8 = Most Challenging	20	42	40.8	100.0
	Total	49	100.0	100.0	

Figure 11 Cohort survey part one - Pie chart illustrating the results of the rank table for use of audio software.



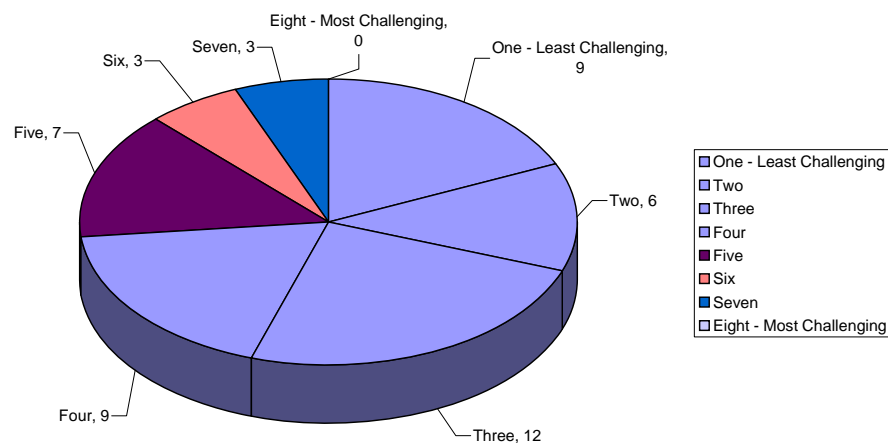
Respondents were asked whether they had previously used a minidisk player or recorder, (the primary device used in the module for sound recording). 46.9% indicated they had no prior experience of this type of equipment. Although 46.9% of respondents said they had never used a minidisk recorder before, 73.5% of respondents ranked using the recorder 4 or below in terms of challenge. This lower level of perceived challenge could be attributed to the respondents'

experience of other recording devices, indicated by the number of respondents who had experience of using microphones (63.3%).

Figure 12 Cohort survey part one - Rank table for use of minidisk recorder.

		Frequency	Percent	Valid %	Cumulative Percent
Valid	1 = Least Challenging	9	18.4	18.4	18.4
	2	6	12.2	12.2	30.6
	3	12	24.5	24.5	55.1
	4	9	18.4	18.4	73.5
	5	7	14.3	14.3	87.8
	6	3	6.1	6.1	93.9
	7	3	6.1	6.1	100.0
	8 = Most Challenging	0	0	0	100.0
Total		49	100.0	100.0	

Figure 13 Cohort survey part one - Pie chart illustrating the results of the rank table for the use of minidisk recorder.



Respondents were also asked to indicate the degree of guidance they felt they would need with regard to five activities associated with the completion of the first assignment.

Figure 14 Cohort survey part one - Table matrix of respondents' anticipated level of guidance needed.

Level of Guidance	Guidance Conducting Interview		Guidance with Minidisk Recorder		Guidance with Transfer		Guidance with Microphone		Guidance with Software	
	Count	%	Count	%	Count	%	Count	%	Count	%
None	3	6.1	11	22.4	3	6.1	11	22.4	2	4.1
An Overview	19	38.8	11	22.4	6	12.2	13	26.5	6	12.2
Explanation & Demonstration	19	38.8	22	44.9	28	57.1	19	38.8	18	36.7
In-Depth Explanation & Demonstration	8	16.3	5	10.2	12	24.5	6	12.2	23	46.9

The first noticeable responses on the table above (Figure 14) shows that 46.9% of students expressed a need for in-depth guidance with software, and 24.5% anticipated the same level of support would be needed for transfer guidance. Both of these are either software or technology specific and perhaps linked to the software and technology fixation mentioned earlier. The table also illustrates the relatively low level of anticipated guidance needed in support of the use of both the minidisk recorder and microphone; 48.9% indicated they required no more than an overview of the recorder. Similarly, 44.8% indicated they required no more than an overview of the microphone. It was a commonly held perception by students that sound recording was a relatively simple task. One of the purposes of the second survey was to ascertain whether the students' experience, through the completion of the first assignment, changed this perception. After completing the first assignment, students were again asked to rank in order of difficulty the same eight assignment tasks presented in the first survey.

40% of respondents showed an increased awareness of the complexities of the recording process, ranking one or other aspects (using the minidisk recorder / using the microphone / recording the interview) at least two points higher (or more difficult) than they had first anticipated. 40.8% of respondents in survey one, indicated that they considered using the sound software to be the most challenging task. Survey two indicated that fewer respondents 31.4% (a reduction of 9.4%) thought that the sound software had been the most challenging task.

Preparation, approach and resource usage

Survey two also sought to capture information pertaining to assignment based learning activities that took place during the students' independent study time.

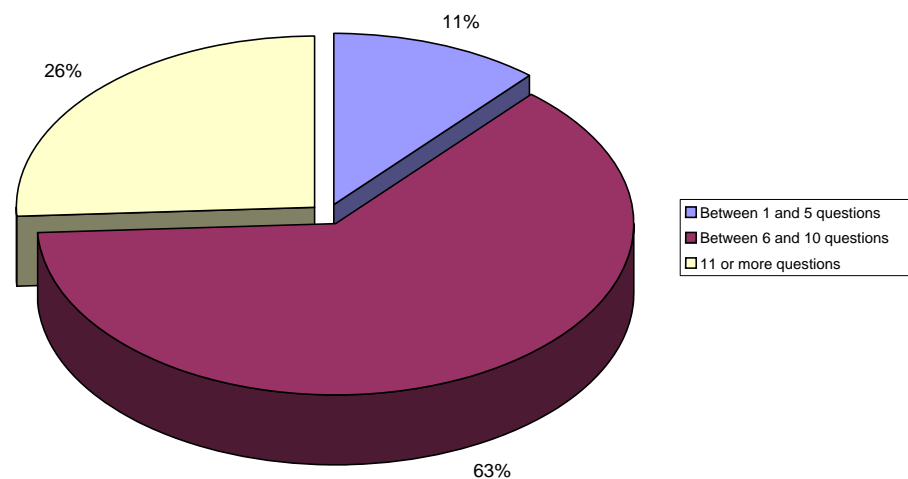
Questions pertaining to these activities were grouped into one of three categories, 'Preparation', 'Approach' and 'Resource Usage'.

Preparation

During the module, students were encouraged to utilise a number of opportunities to better their performance. This included taking time to become acquainted with equipment, question preparation and practising these on family members or colleagues.

94.3% of respondents indicated that they practised using the recording equipment prior to undertaking the interview. When asked how many questions were prepared for the interview, 63% of respondents indicated they prepared between 6 and 10 questions (see Figure 15 below).

Figure 15 Cohort survey part two - Pie chart illustrating the number of questions prepared for interview by students.



In preparation for their interview, only 45.7% of respondents indicated that they practised their prepared questions and interview technique.

Approach

Figure 16 below offers a general view of student performance cross-tabulated with their approach to preparation. Approach is represented by the decision made by the respondent with respect to question preparation, practice of interview technique and/or questions.

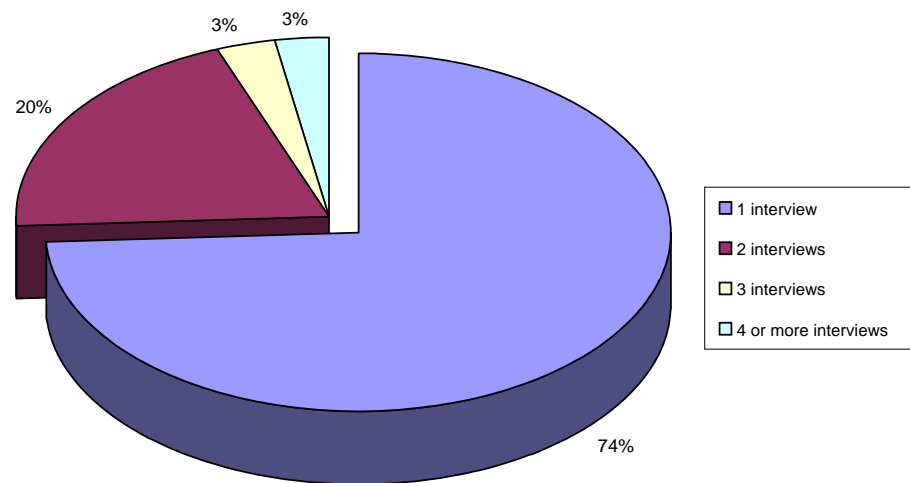
Figure 16 Cohort survey part two - Table cross-tabulation of number of questions prepared / Practice interview questions / Practice interview technique and criteria grade - Recording and Editing.

				Criteria grade - Recording and Editing							Total			
				E4	D7	C8	C9	C10	B11	B12		B13		
No	No	Number of questions prepared	1 - 5	1									1	
			6 - 10	1	1	1	3	2	1	1			10	
			11+	1				2	1	1			5	
		Total		3	1	1	3	4	2	2			16	
		Yes	Yes	Number of questions prepared	6 - 10				1					1
Total							1					1	2	
Yes	No	Number of questions prepared	6 - 10			1							1	
			11+							1			1	
			Total			1				1			2	
	Yes	Yes	Number of questions prepared	1 - 5			2							2
				6 - 10		3	2		2	1	1			9
11+					1				1		1		3	
Total		4	4			2	2	1	1		14			

The data represented in the table illustrates that only respondents who did not practise at all scored the lowest grade (first highlight column), and the two respondents who recorded the highest grade (second highlighted column) prepared six or more questions and practised these questions prior to the interview.

For assessment purposes all students were required to submit a single edited interview for the first assignment. However, they were encouraged to consider conducting and recording more than one interview to help support the development of their skills. Only 26% of respondents indicated that they had attempted two or more interviews.

Figure 17 Cohort survey part two - Pie chart illustrating the number of separate interviews conducted by students.



Resource usage

Respondents were asked to indicate the degree to which they made use of the university resources (sound recording equipment) and whether they used, or had access to, alternative sound recording equipment. 42.9% of respondents indicated they had alternative access to equipment, of these, 46.7% or in other words seven respondents did not use the University sound recording kits.

Student self evaluation and review

Within the second survey respondents were asked to comment on both their assignment performance and their learning experience.

Learning experience

85.3% of respondents indicated that they felt they had had sufficient time to practise using the equipment.

94.1% said they felt adequately prepared in class to be able to undertake the interview. However 73.5% indicated that they would like the opportunity to practise sound recording and interviewing during class time.

23.5% indicated that they felt the guidance and support could be improved. All respondents were encouraged to offer suggestions for the improvement of guidance and support, only 5 did. 3 responses suggested 'further software training', one suggested 'further guidance' on interviewing and one suggested 'further support with recording'.

Self-evaluation

47% of respondents accurately self-assessed their overall performance in the first assignment. The table below illustrates the spread of achievement and self-assessment. The highlighted cells show the number and grade of those respondents who accurately assessed their own performance.

Figure 18 Cohort survey part two - Cross-tabulation of Overall element 1 grade / Performance self evaluation.

		How well do you think you have performed?				Total
		Satisfactory (D)	Good (C)	Very Good (B)	Outstanding (A)	
Element 1 Grade Obtained	F0	1				1
	D6	2			1	3
	D7	2	2			4
	C8	2	3	1		6
	C9	2	4			6
	C10	1	2	2	1	6
	B11		1	1		2
	B12		2	1		3
	B13	1	1	1		3
Total		11	15	6	2	34

Learning issues and verifying observations and assumptions

The sample size of the surveys was comparatively small with only 34 respondents completing both surveys. From my experience of teaching DM1006, while the survey findings were generally consistent with my own observations and assumptions, it was a useful preparatory exercise. It provided some limited comparative data for later research carried out as part of this project. In addition to the data collected from the survey, the assignment-based work of students who had studied the module in previous years was reflected upon. This included reviewing assignments, revisiting assessment feedback sheets and comparing module grades over three academic years. (See chapter 2 'The starting point - a grounded approach' p.53 for a further rationale for this analysis.)

Given that assignment-based activities took place during the students' independent study time it was important that students were prepared and had adequate support mechanisms. The primary support mechanisms included an individual's prior experience or the ability to look at comparative works of others.

However, prior media experience across the cohort was less than 50%. Critical contextual awareness of comparative media was very low. The lack of formal experience perpetuates a perception that the recording process was relatively easy. This perception plus other factors such as the lack of independent study skills, for example, time management, contributed to the lack of preparation by the students. The survey indicated that 50% of students failed to adequately prepare for the assignment tasks. Prior experience of using the recording equipment (minidisk) was limited with the majority of students borrowing the recording kit only once. This suggested that most students had to learn to use the minidisk recorder without the support of the tutor on the same day as their interview recording. This was evident in the work submitted for assessment. Common difficulties included:

- Mechanical function of the equipment for example:
 - failing to put batteries in the microphone, or minidisk recorder
 - setting the wrong record mode, such as mono.
 - failing to turn the microphone on.
- Failing to monitor recording through headphones which helps to alert students to:
 - general recording levels
 - microphone noise from over handling the microphone
 - inadequate microphone placement
 - background noise.

See appendix 2b - Examples of Assignment 1 student work

1. The sound file 'Student_A.wav' - This example illustrates poor microphone handling and control. Throughout the recording we can hear the student handling the microphone.
2. The sound file 'Student_B.wav' - This example illustrates problems with microphone placement. In this example we can hear what is termed 'piping', a form of distortion. This can be attributed to the microphone being placed too close to the mouth.
3. The sound file 'Student_C.wav' - This example illustrates poor awareness of background noise when conducting the interview. Throughout this example, we hear background music, present at the time of the interview. Listen closely and you will hear the music disjointed through the editing

of the interview. When asked about the music the student stated "I didn't realise music was playing. I only noticed it when I came to transcribe the interview."

The above students neither set nor monitored recording levels.

Only a very small number of the cohort undertook more than one interview. Therefore the students did not 'practise'; at best they experienced the process.

Authentic activity

Undergraduate art and design education has evolved from the apprenticeship traditions of applied arts and crafts (see chapter 2 'Art and design pedagogy - educational theory' p.24'). As such, the role of tutor as practitioner is already firmly embedded in art and design teaching and learning practice.

The first assignment enabled students to begin to acquire and develop recording techniques, within the context of a location-based interview and provided experiential opportunity within an authentic context.

It would be fair to say that the assignment offered authentic activity within the context of the discipline; however, I would argue that it was less successful within the construct of Situated Learning Theory. Learning requires 'enculturation' (Brown *et al.* 1989), a social matrix (Brown *et al.* 1989; Clancey 1995) of collaboration, and both direct and legitimate peripheral participation (Lave and Wenger 1991; Brown *et al.* 1989) (see also chapter 2 - 'Situated learning' p.28). Students did receive tutor-fronted demonstrations/lectures but had little or no tutor or peer support during much of the assignment-based activity. Students were actively dissuaded from working in pairs or small groups during the interview recording process, as it could be intimidating to have two or more interviewers interview an inexperienced interviewee, who in all likelihood will be already nervous. The assignment activity, itself the primary vehicle for acquiring and developing recording skills failed to facilitate the use of a social matrix. Also because of the location and time the activity was undertaken, no coaching was available while the activity was undertaken.

...teachers or coaches promote learning, first by making explicit their tacit knowledge or by modelling their strategies for students in authentic activity. Then teachers and colleagues support students' attempts at doing the task. And finally they empower the students to continue independently. (Brown *et al.* 1989, p.39)

Although the assignment activity was problematic in terms of support there were a number of examples in DM1006 weekly class-based activities where many of the elements of situated learning did occur. For example, during the week three session students did in fact engage in some collaborative learning, sharing interview questions formulated during their independent study time in the preceding week (see Figure 7, p.74 - students devising interview questions for the role-play activity). Through the student tutor role-play, there was an example of direct and peripheral participation. It is however fair to say that this type of tutor-facilitated activity was limited. In later weeks, and to support enculturation, a variety of broadcast, animation and multimedia examples were presented and discussed. Although not directly facilitated by the tutor, it is important not to ignore the naturally occurring conversations and narratives exchanged between students which occurred in class which contribute to the shared knowledge and culture (Brown *et al.* 1989).

An issue with practice

If we consider the first assignment (see appendix 1(a) and 1(b)) as a framework of skills and experiences and then look at the number of complete learning cycles for this framework, most students completed only one. As such there was no process of reflection, refinement, planning and testing of the framework of skills as a whole (see also chapter 2 - 'Learning by doing' p.25). Through my experience of teaching the module I came across students from time to time who did repeat the assignment in its entirety; however, this was very rare. It was more common for students to repeat individual tasks within the assignment framework. The level of repetition of individual tasks varied. I suspect that this was linked to the students' perception of tasks, (see 'A profile of DM1006 Student cohort' earlier in this chapter); access to resources and facilities to support the execution of the tasks and the changing profile of the cohort. By this I refer to the students' prior experience, motivation, expectations. The cohort survey provided an insight into the extent to which one of the tasks, that of conducting an interview, was repeated. 74% of respondents indicated they did not attempt more than one interview (see 'A profile of DM1006 Student cohort' earlier in this chapter). This was significant as it was through the execution of the interview within the construct of the location (environment) that students were exposed to a range of recording skills and techniques (SA). (See Figure 24, p.100 for an overview of SA within the construct of the interview. See also chapter 2 - 'Situation awareness and SRIT - 'dynamic skills', p.62.)

Reflective practice

Within the first assignment, the primary function of the transcription of the recorded interview was to provide the student with the opportunity to explore and develop compositional ideas. The task however proved also to be very effective at eliciting self-reflection or as Schon (1987a) described in the context of the practicum -reflection-on-action (See also chapter 2 - 'Reflection and the practicum' p.26). Interview transcription was frequently the time where students identified and acknowledged performance issues pertaining to recording quality, such as background sound interference, poor microphone handling and inadequate recording levels. Psychologist, Professor Martin Conway states that: "Sound streams have a temporal order and memory has a temporal order. Sound unfolds in time where vision tends to be parallel and immediate" (BBC 2003). The parallel simultaneous use of audio and visual medium better aids reflection (see also chapter 2 - 'Modal density' p.63).

Harper (2003) acknowledges the role active reflection plays in his ongoing development. "I do self crit, that's where the ongoing learning thing is even after years of doing those (interviews) and I have done hundreds of live reports... You can always improve."

Monitoring sound levels was a key task implicit in the interview and recording process. In the first assignment students were advised and encouraged to monitor sound levels through headphones as a means of developing recording technique. This is what Schon (1987a) terms reflection-in-action (see also chapter 2 - 'Reflection and the practicum' p.26). Through audible monitoring students were able to develop awareness of the characteristics of the microphone, identify problems such as those referred to above and explore possible solutions, in essence repeating the learning cycle and in other words develop SA.

Reflecting upon Harper's (2003) account of his learning experience (see 'The reflections of a practitioner - subject matter expert' later in this chapter), and drawing from my own experience of teaching the cohort and reviewing the work the cohort has produced (see appendix 2b - Examples of Assignment 1 Student Works provided on the accompanying CD-ROM), led me to suspect that a significant number of students found the interview/recording process overwhelming first time round. It could be the range of implicit simultaneous tasks (multi-tasking) they were expected to carry out and/or apprehension/nervousness of the interview exchange. The lack of adequate monitoring of recording through

the use of headphones was the most prevalent symptom of this. As I have already stated, this was significant as headphone monitoring functions as a feedback tool, facilitating reflection-in action affording the opportunity to refine ongoing tasks (SA). Boyd (2001), Fleming (2002), Beaman (2000) and Harper (2003) acknowledged that recording levels are important.

For a complete summary of the strengths and weaknesses of DM1006, including teaching issues, see Figure 25, p.102 - 'DM1006 Needs analysis summary' at the end of this chapter.

Task analysis and SRIT skills

Thus far in this chapter I have outlined how DM1006 was delivered and looked at the student cohort. In designing an interactive artefact it is important to know your user and understand what they do (Preece *et al.* 2002; Hughes 2000) (see also chapter 2 - 'UXD - an interaction design (TSL - product) perspective' p.40). Knowing about your user helps to ascertain the style and complexity of language that can be used within an artefact. Understanding what your user does, comparing the nature and requirements of a task (SRIT skills in the first assignment) against the task performance of the users (student) is also important in facilitating a successful interactive artefact design. This is what Donald Norman in his interview with Rheingold (1993) referred to as 'Task Analysis'.

It is therefore important to be clear also about what SRIT skills are. In identifying these, I drew upon my own knowledge of the domain and the knowledge of other SRIT subject matter experts (SMEs), the latter being a source of information which Endsley *et al.* (2003, p.67) identified as indispensable (see also chapter 2 - 'The starting point - a grounded approach' p.53).

SA and a goal-directed task analysis

In the development of SA (an intrinsic aspect of SRIT, see chapter 2) a goal-directed task analysis is required. Endsley asserts, "Before a system can be designed to support situation awareness, a clear understanding must be achieved regarding what supporting situation awareness means in a particular domain" (Endsley *et al.* 2003, p.65).

In identifying tasks intrinsic to SRIT, I have drawn upon my own knowledge of the domain and the knowledge of other SRIT SMEs, the latter being a source of information which Endsley *et al.* (2003, p.67) identified as indispensable.

Undergraduate study of SRIT elsewhere in the UK

In an effort to obtain a broader picture of the study of SRIT in the UK and aid the task analysis, a survey of SMEs was designed and carried out. This survey was targeted at undergraduate award leaders in higher education institutions across the UK. The 'Course Discover' (Ecctis Ltd 2003) database, administered by the 'ECCTIS' consortium on behalf of the UK Department for Education and Skills, was utilised to identify potential undergraduate awards. The selection of possible participants in the survey was based on the listing details of each award within the database and a surmised likelihood of the inclusion of SRIT as part of each award's curriculum. As a result 176 awards were selected across 13 disciplines. The resulting sample selection encompassed 83 higher education institutions.

The survey sought to ascertain data across four key areas:

- 1) Profile of student cohort
- 2) Study environment
- 3) Methods and resources employed
- 4) Priority within study.

To elicit this information from the 176 recipients and maximise the number of returns for the survey, a range of factors had to be taken into consideration regarding the design and administration of the survey.

- The inclusion of SRIT in the curriculum of the award was speculative, based solely on the title of the award as listed on 'Course Discover' (Ecctis Ltd 2003) database.
- Time and resource constraints made it impossible to identify named recipients of the survey.

Therefore validation of the existence of SRIT and contact with the prospective recipients could not be established prior to administering the survey.

With this in mind:

- The survey was constructed so that irrespective of the existence of SRIT in the award recipients could still participate with the proviso that they had prior experience in teaching SRIT.
- The questions had to be constructed so that they would not be considered invasive or threaten the recipients' intellectual property rights.
- The survey had to be quick to complete and easy to return.

- The recipients needed to benefit from the completion and return of the survey.

Each recipient was sent a cover letter, survey and stamped addressed reply envelope. In addition to the paper-based survey recipients were given the option to alternatively complete the survey online.

Figure 19 Online Survey @ <http://www.undertheblue.net/survey/provider1>.

The screenshot shows a web browser window displaying an online survey form. The browser's address bar shows the URL <http://www.undertheblue.net/survey/provider1>. The page title is "Study And Training Providers - Practice and Delivery" and the main heading is "Conducting and recording audio interviews".

The form contains the following fields and questions:

- Name of Institution / Organisation:
- Your Title and Name:
- Your Email Address: (required for submission validation)
- Contact Telephone Number:
- 1:0) Does your institution offer instruction/study at undergraduate level in the skills associated with conducting and audio recording interviews?
 - No
 - Yes

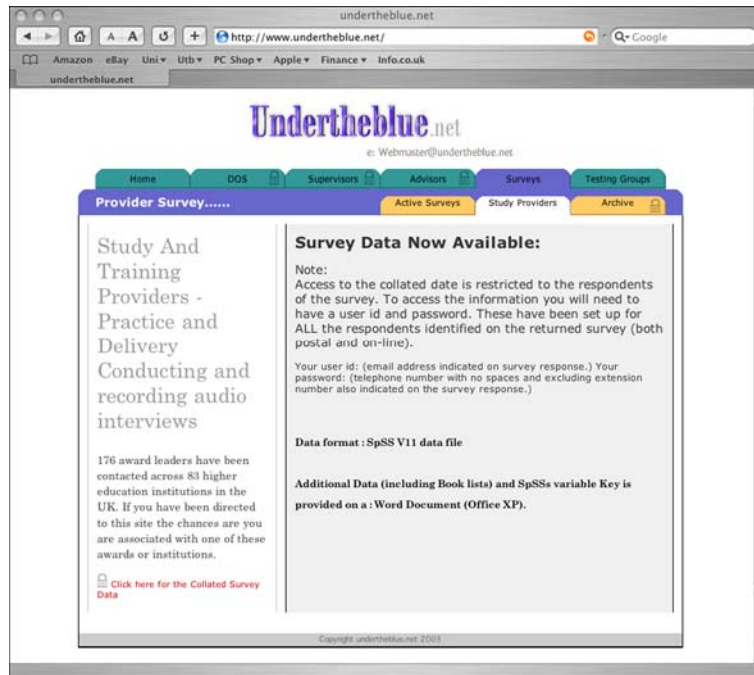
If your answer is **No** then please continue to **section 2** below.

If your answer is **Yes** please list the title of the awards in the space provided to the right.

Please list the title of the awards or courses in this space
- 1:1) Each academic year approximately how many students undertake instruction/study in conducting and audio recording interviews?
 - 1-20
 - 21-35
 - 36-45
 - 46-55
 - 56+

In completing and returning the survey all respondents were promised access to the collated data. Data was made available on this research project's web site: <http://www.undertheblue.net> in June 2003.

Figure 20 Research Project Web Site <http://www.undertheblue.net>.



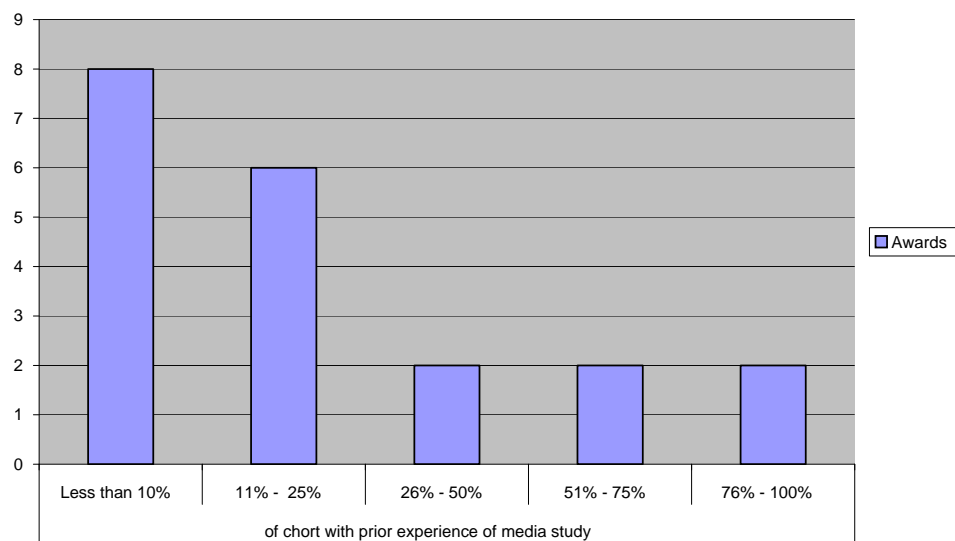
Of the 176 surveys distributed a total of 24 or 13.6% were completed and returned. Of these only one survey was completed and returned via the online survey.

Profile of student cohort

Of the 24 responses, 2 indicated that they did not currently offer SRIT in their award.

Nearly three quarters of the awards delivering SRIT indicated that 50% of their student cohort had no prior experience of media-based study. This is not substantially different from the 63% on DM1006.

Figure 21 Study and Training Providers Survey - Award cohorts' prior experience of media studies.



Study environment

The survey responses indicated an average student staff ratio of 20:1 across the 22 awards. In addition 59% of these had 55 or more students studying SRIT annually.

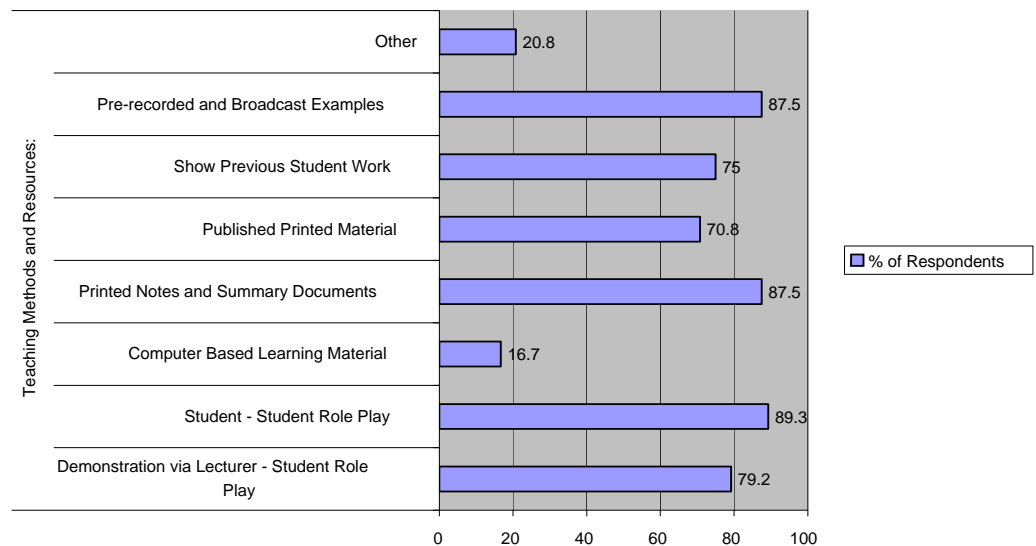
Student - tutor (class contact) and amount of self-directed student study time necessary to study SRIT varied from 3 to 60 hours. This wide variation in study time could be viewed as a reflection of the relative position and level of significance that SRIT holds within each of the respective awards and given the wide range of awards participating in the survey, the results were not unexpected. As previously stated, the module DM1006 was approximately 120 - 130 hours, however the aspect of the module (assignment 1) that represented the focus on SRIT itself constituted a maximum study of around 70 hours, the reality was that regularly students would successfully complete their study using less than the 70 hour allocation.

Methods and resources employed

The survey sought to ascertain the methods and resources employed to teach SRIT.

The most common method was student-to-student role-play. Resources included pre-recorded/broadcast material and printed notes.

Figure 22 Provider Survey - Teaching Methods and Resources.



Four respondents indicated they utilised computer-based learning material including web and/or CD-ROM. When cross-referenced with a later question in the survey, none of these four respondents were familiar with any computer-based interview and/or sound recording-based simulator-training programme. This suggested that the computer-based learning material utilised was either contextual

or reference-based, as was the case at that time with DM1006. Only one of the respondents indicated that they had knowledge of a computer-based interview and/or sound recording-based simulator-training programme. (This is looked at in element 2 of the supporting creative work.)

Of the five respondents who indicated the use of other methods and resources, practical exercises or assignments were the most predominant.

Assessment activity and practice

When assessing student performance, a greater emphasis was generally placed on the practical application of skills over the ability to demonstrate a theoretical understanding. All except one of the respondents used practical assignments/tasks completed by the student outside class time as an assessment activity. No respondents indicated the use of written tests. Although 75% of respondents agreed that studio-based activities could only offer limited opportunities to develop skills, 54.2% used practical exercises during tutor-led studio sessions for assessment purposes.

87.5% of respondents agreed that practice was the most important factor in developing SRIT skills, and 58.3% indicated that they felt that wider access to resources such as variety of microphones would contribute to an enhanced understanding by students of the interview recording process.

Priority within study

Respondents were then asked to rank twelve SRIT skills students would need to acquire at introductory level in order of priority. Seven respondents declined to answer the ranking questions. It is interesting to note that all seven respondents added their own written notes to the questionnaire pointing out the equal importance of the skills they were asked to rank. Of the remaining seventeen respondents the results were as follows:

Figure 23 Provider Survey - Table of ranking order for introductory SRIT skills.

SRIT skills to be acquired / developed at introductory level	
1- Highest Priority	Interview preparation
2	Listening Skills
3	Monitoring recording levels during and interview
4	Communication Skills
5	Microphone placement and control
6	Identifying opportunities for follow up questions during an interview.
7	Assessing the suitability of a potential interview location
8	Handling the recording device, minidisk, DAT etc.
9	Monitor and compensate for background noise during an interview
10	Body language - Providing non-audible encouragement during interview
11	Sound editing skills
12 - Lowest Priority	Choosing an appropriate microphone type

SRIT elsewhere in the UK – a summary

DM1006 compared reasonably with the survey data collected, taking into consideration the relative location of SRIT within awards and the likely differences in study focus. Class sizes were on average 20 students to 1 staff. The minimum required study time showed some variation but was not very different if the rationale for the variations, as discussed earlier in this chapter, is taken into consideration. With the exception of the student-to-student role-play, which did not take place in DM1006, teaching methods and resources were consistent. The use of student-to-student role-play could indicate a greater emphasis being placed on supporting or developing the interview aspect, but this is only speculative. The utilisation of practical assignments, absence of written tests and balance between theory and practice, were also consistent. The averaging of the 'skill ranking' question showed a balanced prioritisation across interview and recording skills. As expected, 'practice' was considered the most important factor in developing SRIT. There was some commonality in the use of published printed material (see 'indicative reading' below), and a clear absence of the use or knowledge of any comparable computer-based interview and or sound recording simulator training programmes.

A brief overview of published SMEs' views on SRIT

Key texts – indicative reading

As a part of the provider survey, respondents were asked to list their recommended reading for SRIT. Of the 24 respondents two were established published authors in the field, (Beaman 2000) and (Fleming 2002), with a further respondent indicating an imminent publication. Of the identified publications the

most popular were 'Interviewing for Radio' (Beaman 2000), and 'Broadcast Journalism, Techniques for Radio and Television News' (Boyd 2001).

In common with the survey, DM1006 also recommends 'Interviewing for Radio' (Beaman 2000), and in addition also suggests 'Interviewing for Journalists - How to Research and Conduct Interviews You Can Sell' (Clayton 1994).

Interviewing

Each of the four publications referred to above share, to some degree, a concern for the interview process. Of these, Beaman (2000) and Clayton (1994) focus more readily upon interview skills and techniques as they relate to radio (Beaman) and print-based (Clayton) interviewing. Fleming (2002) and Boyd (2001) have a greater context and culture focus and address interview skills within this construct.

As one would expect, irrespective of the interview context (print, broadcast) there is high degree of commonality of subject matter across the publications. This includes:

- Interview preparation /research
- Introductions
- Question types (open / closed / multiple / summary / etc.)
- Listening skills
- Body language
- Journalistic styles and protocols.

Audio recording

As Clayton's book focuses on print-based journalism, it is Beaman (2000), Boyd (2001) and Fleming (2002) that discuss the recording process.

The approach to the discussion of audio recording differs across the three publications. Beaman (2000) offers the reader 'technical advice' in the form of reflective exercises and bullet point lists. Fleming (2002) and Boyd (2001) on the other hand, offer advice in the form of a directive monologue. Again, there is commonality of audio recording matter across the three publications that encompass:

- Equipment checks
- Location evaluation
- Arranging the interviewer and interviewee
- Microphone placement and handling

- Establishing recording levels and automatic level controls (ALC)
- Checking the recording at the conclusion of the interview

While Boyd (2001) does make a very brief reference to the use of headphones, Beaman (2000) is the only author to attach significant importance to headphone monitoring during the interview process. Beaman (2000) also attaches significant importance to practice, a view shared by Fleming (2002) and Boyd (2001).

The reflections of a SRIT practitioner – subject matter expert

As part of the task analysis I wanted to access the views and reflections of current practitioners. This proved to be problematic as both local public service and commercial radio broadcasters declined the request to participate. Through alumni contacts I was eventually successful in securing an interview with a BBC East Midlands journalist. The interview format was semi-structured and took place on the 24th March 2003 at my home and was documented using an audio recorder. Several noteworthy elements of the interview are reproduced in the body of this chapter and can be found on the following page. (The full transcript could not be included in the appendix because of academic regulations dictating the maximum word count for both the main body of this thesis and its associated appendices.)

The interviewee

Dave Harper graduated from Staffordshire Polytechnic in the 1980s with a Bachelor of Arts with Honours degree in Multi-Disciplinary Design (Audio Visual). The first eight years or so after graduation were spent working in public service (BBC) and independent radio, predominantly as a freelance reporter. During the 1990s he moved into producing news, current affairs and documentary programmes and in 1994 made the transition to television as an assistant news editor, reporter and correspondent.

The interview

What emerged from the interview was a view of the importance of mastering equipment beyond that of “button pressing” as Mr Harper put it; developing recording or “equipment manipulation” skills to the point that they become second nature; the positive impact this has on breaking down the barriers to advancing interviewing skills; and developing confidence through practice and self-criticism.

Harper on sound recording

When you start off you are worrying about everything. You're worrying about the level you have set the equipment, you're worrying about the questions that you ask and you can't cope with it all. You do get back and you find there is a dirty great plane flying over head at that point and it's just over the answer that's really good, or you don't get them to speak in a way that makes it easy to edit... Harper (2003)

You can teach anybody who has three brain cells to rub together what buttons to press, that is not the hard part, it's the manipulation of the hardware in relation to everything else that's going on which is the difficult bit. Harper (2003)

...it's at the point where you don't worry about the equipment, you don't worry about everything else going on around, you're just worrying about the person that you are talking to giving you what you need to get out of them. Harper (2003)

Harper on interviewing

When you get better, when you gain in confidence when you start being able to take certain things for granted - at that point you are able to concentrate more on what they are saying and you know now I'll do an interview, I'll know before I listen back to the interview. I'll remember which answer it is I want to use and I'll know...I'll quite often remember the 'in words' because I'll be listening for the moment I am gonna get the answer that will fit in with the story or will tell their story the best. You get that with experience. Harper (2003)

Harper on confidence, learning and development

As you gain in confidence whether it's using equipment or it's in the kind of soft end of it, those things become automatic. You begin to trust what you are doing, what buttons you are pressing, the levels you set ... you can then concentrate on the important part which is getting the right words out of the person you are interviewing. Harper (2003)

...the best way of learning is...it's kind of practice, it's structured practice but in a non-threatening.... in an environment where you are allowed to make mistakes and learn from those mistakes. Harper (2003)

I do self-crit, that's where the ongoing learning thing is even after years of doing those and I have done hundreds of live reports.... You can always improve. Harper (2003)

SRIT and practical skills

As argued in chapter 2 (see 'The starting point - a grounded approach' p.53), the task and needs analysis (part of the grounded approach) has been important in helping to better understand the learning and teaching context. First, it helped to identify learning and teaching strengths, weaknesses and needs. (See 'Strengths, weaknesses and needs' below). Secondly it helped to generate an indicative picture of what SRIT skills are and how they are acquired. However, an attempt to define

all aspects of SRIT would be a research project in itself. In understanding a discipline Brown *et al.* (1989, p.4) suggested: "...the context of activity is an extraordinarily complex network from which practitioners draw essential support. The source of such support is often only tacitly recognised by practitioners, or even by teachers or designers of simulators."

Before summarising the strengths and weaknesses of DM1006 I feel it would be helpful to first outline what is meant by SRIT and practical skills within the context of this project. The term 'practical' pertains to the multi-sensory active experience that draws upon aural, visual and tactile senses in the execution of tasks and activities, associated with SRIT. It is this high degree of modal density that characterises interactions concerned with SA. The elements of SRIT, goals, tasks, and activities are outlined as a loose sequential timeline in Figure 24 below. As already stated, the grey area in Figure 24 represents the dynamic environment in which SA is developed.

Figure 24 A summary table of SRIT tasks.

SRIT Tasks				
Conduct and audio record an unscripted, undirected interview with a stranger. (What's it like to be...?)				
Goal	Tasks	Activities	Notes	T&L issues
Interview preparation:	(T1) Identify interview objectives:	Specific background research (of a known person 'celebrity')	Objective may be re-evaluated during the interview.	-
		Specific background research (of a known event, issue, occupation etc)		YES
		General (generic) questions		YES
	(T2) Identify journalistic style	Synthesise research		YES
		Formulate primary questions:		YES
		Order primary questions:		YES
	(T3) Location choice / evaluation	Visit location - determine suitability for interview / audio recording	This may otherwise occur at the point of interview	-
		Relocate as appropriate		-
	(T4) Familiarisation and testing of sound kit:	Select components (batteries, blank MD, recorder, mic, headphones)		YES
		Assemble components (batteries, blank MD, recorder, mic, headphones)		YES
Test components (batteries, blank MD, recorder, mic, headphones)			YES	
Location set-up	(T5) Evaluate / re-evaluate location for noise	Eliminate background noise (juke box, mobile phones, open windows, doors etc) or relocate.	The tasks and activities identified in this grey area overlap. Some run concurrently and are host to a wide range of variables, requiring an	YES
		Placement of interviewer and interviewee		YES
		Microphone placement		YES

	(T6) Assemble sound kit	Sound kit set-up	iterative cycle of evaluation and decision-making. (Situation Awareness)	YES
	(T7) Introduction (Establish rapport)	Personal introduction		-
		Sound kit introduction to interviewee		-
	(T8) Test sound kit set-up	Test /establish sound levels		YES
		Confirm microphone placement or reposition		YES
		Confirm recording		YES
Conduct & record interview:	(T9) Ask a question/s	Listen		-
		Evaluate answer based on objectives. Either repeat / rephrase / ask the next question / ask a follow-up question / re-evaluate objective / reformulate objective / conclude the interview.		-
		Monitor and respond accordingly (based on objectives and journalistic style) to nonverbal communication (body language).		-
	(T10) Monitor recording quality	background noise - either pause interview / repeat a question /ask for the interviewee to repeat an answer / rectify and ignore compromised recording based on quality of response in relation to objective		YES
		Mic noise - adjust grip, either repeat a question/ask for the interviewee to repeat an answer / rectify and ignore compromised recording based on quality of response in relation to objective		YES
		Mic placement - adjust mic position and - either pause interview / repeat a question/ask for the interviewee to repeat an answer / rectify and ignore compromised recording based on quality of response in relation to objective	YES	
Secure the recording	(T11) Interview recording	Material solicited based on concluding objective	YES	
		A record of the recording is confirmed	YES	

Strengths, weaknesses and needs

Figure 25 below provides a summary of the strengths, weaknesses and needs within DM1006 associated with learning and teaching of SRIT. The list has been used to help to inform the evaluation of the TSL artefacts (see element 2 of the supporting creative work accompanying this thesis for the artefact reviews) and chapter 4 'The scope, scale and rationale' (requirements) of the design of a TSL (interactive) artefact. By producing an artefact in response to defined issues (needs) also helps to inform how the artefact could be tested and evaluated (Preece *et al.* 2002) (see also chapter 6 'Research methodology').

The questions I have posed within Figure 25 below are intended to highlight possible opportunities for the application of TSL in DM1006. (See also chapter 4, where these are considered as part of the process of developing the proposal for the design of a practice-based TSL artefact to support SRIT skill acquisition).

Figure 25 DM1006 Needs Analysis Summary.

Needs Analysis Summary	
Weaknesses	Strengths
Students had limited critical awareness of comparable media utilising SRIT to draw upon.	Students frequently and independently reflect on their interview technique/performance during the transcription and editing phase of the assignment.
Students started out with an inaccurate perception of difficulty of SRIT tasks.	The assignment activity helps to correct the perception of the student regarding the process of sound recording and interviewing.
Students were preoccupied with acquiring software skills.	The assignment provides opportunities for genuine experience of recording and interviewing, and potential exposure to the full range of challenges within SRIT.
Students did not adequately prepare for the interview. <i>The importance of preparation and practice was raised within the practitioner interview and highlighted in all the key texts.</i> Q1: Could a TSL artefact promote preparation?	
In class: guidance / demonstration with little opportunity to participate. <i>Student role-play was identified as being used by at least three quarters of the providers.</i> Q2: Could a TSL artefact support role-play?	
Students had difficulty using the recording equipment. <i>Recording equipment is only demonstrated in class. There is no substantial student hands-on equipment operation in the class because of limited equipment (sound kit) availability.</i> Q3: Could a TSL artefact enhance equipment familiarisation?	
Students seldom repeated tasks, (practice) both in terms of equipment and interview process. Cohort survey - 75% of students did not practice 87.5% of respondents to the provider survey indicated that practice was considered the MOST important factor in developing SRIT skills Limited equipment availability a contributory factor Q4: Could a TSL artefact facilitate SRIT skill practice?	
Alternative recording equipment (e.g. microphones) is discussed, but is neither demonstrated by the tutor nor available to experience/be used by the student.	

<p>The assignment offered very limited opportunity for the students to participate in collaborative learning.</p> <p><i>(Note: Collaboration helpful in introducing and developing complex skill clusters) - see chapter 2.</i></p>	
<p>Students found the interview/recording process overwhelming first time round.</p> <p>A significant proportion of learning took place outside the class (location-based interview) and was thus neither tutor-mediated nor supported. - Absence of skills nurturing / formative feedback.</p> <p>Q5: Could a TSL artefact be used to nurture SRIT skill acquisition? (Incremental, supported introduction)</p>	
<p>Difficult to ensure consistency of experience</p> <p>Q6: Could a TSL artefact improve consistency of learning experience?</p>	

Chapter 4 - Learning technology opportunities

In this chapter I develop a scheme for the design of a learning technology artefact to be used in the support of learning and teaching initiated within the third taught session of DM1006. This chapter describes the type (style) of the artefact, scope of learning activities and SRIT skills covered. It documents how and where the artefact was to be used and specifies the artefact's aims and objectives.

Reflecting on the needs and characteristics of the subject matter (SRIT) and students

The needs identification and task analysis in chapter 3 helped to identify a range of weaknesses and strengths within DM1006. By also reflecting on the differences between the DM1006 module, other UK providers, published material and the practitioner interview, a number of initial questions came to mind which were noted under Figure 25, chapter 3 and are reproduced here.

Could a TSL artefact:

- Promote preparation?
- Support role-play?
- Enhance equipment familiarisation?
- Facilitate SRIT skill practice?
- Nurture SRIT skill acquisition?
- Improve consistency of learning experience?

Reviewing the artefacts (see element 2 in the supporting creative work) helped to identify, highlight and/or reaffirm:

- The importance of specifically designing the artefact for a predefined type of use.
- The value of breaking down complex activities into isolated or clustered tasks as a means of aiding skill acquisition.
- User reflection away from the TSL artefact is possible.
- The importance of user experience in terms of technical performance of the artefact and subsequent user engagement with content.
- Benefits of flexible user-customisable support in terms of engagement with content within the artefact and artefact use.
- There should be some degree of variability within the repetition of tasks to facilitate skill / knowledge refinement.

Based on my own experience (12+ years) of developing interactive artefacts, I do believe it is possible for TSL to respond to the questions posed about the TSL artefact above. However, the measure of success of the response would be dependent upon how the material is received by the intended user. As previously stated, in designing a TSL solution it is essential to keep in mind the characteristics of the target audience. The challenge would be to design a TSL response that fulfils the needs of the subject matter, the user and the context/environment in which the artefact would be used. It is the aforementioned questions derived from the needs and task analysis and observations made regarding other artefacts as well as the review of literature in chapter 2 that inform a consideration of design and construct (aims and objectives) of the TSL artefact proposed in the remainder of this chapter.

Ascertaining the type of TSL artefact

A key characteristic of the art and design subject is studio-based practice (learning by doing). Whilst VLEs such as WOLF were predominantly text-based, the inclusion of images, audio files and/or video could be said to support legitimate peripheral participation (Lave & Wenger 1991) (see also chapter 2 - 'Situated learning' p.28). The inclusion of such material could be used to demonstrate the use of the sound recording equipment (identified also as a weakness) in DM1006 but it would not facilitate learning by doing.

Situation awareness, simulators – facilitating practice

In developing the dynamic SRIT skills, a student acquires and refines, through practice, an understanding of the complex relationship between interviewer and interviewee, recording environment, and recording equipment. As a consequence, practice is significant in the development of SRIT skills, a view shared by Harper (2003); Beaman (2000); Fleming (2002) and Boyd (2001). The findings of the needs and task analysis, (undertaken within chapter 3) supports this view, but also reveals the absence of practice within DM1006. Practice is neither supported by the tutor nor undertaken by the majority of the module's students.

Of the artefacts reviewed (see element 2 of the supporting creative work) the one that clearly facilitated extensive practice (learning by doing) was Combat Flight Simulator (Microsoft Corp 1998). Flying an aircraft is a complicated dynamic activity, and like SRIT, requires individuals to develop SA. (See chapter 2, for an overview of SA and Figure 24 for an outline of SA within the context of SRIT skills.)

Wickens (2000) defined SA as:

... the continuous extraction of information about the dynamic system or environment, the integration of this information with previously acquired knowledge to form a coherent mental picture, and the use of that picture in directing further perception of, anticipation of, and attention to future events. Wickens (2000, p.211)

Flight simulators are widely used within the avionics industry to develop and maintain SA in pilots. These models of simulators are dynamic - stand-alone and maintain a high degree of fidelity (see also chapter 2 - 'Simulations' p.59). It is imperative that the pilot's (user's) experience within the simulation is directly transferable to real-world actions and contexts.

The objective of this research is to ascertain if TSL can be used to support studio-based practice. Implicit in this objective is a consideration of whether or not student interaction with a TSL artefact can be carried back by the student and utilised within their real-world practices. If we consider, at a basic level, the similarities between the training characteristics of a pilot and those of students studying SRIT, both activities (piloting an aircraft / conducting and recording a location-based interview) occur in dynamic situations, with a high degree of modal density, requiring SA, which is incrementally acquired through repeated experience (practice). Additionally both require that any training be transferable to real-world actions and contexts. The high levels of success that simulators have in supporting / developing SA in pilots, and the transfer of these skills by them to the real world, points to the possibility of a similar TSL construct, i.e. simulation-based artefact, as a means of supporting/advancing SRIT skills.

Instructor-supported or stand-alone simulation models

If we consider the construct of flight simulators further, Aldrich (2005, p.64) distinguished between two models. The first, is what he referred to as 'airline flight simulators' used by the avionics industry. The second he terms 'off-the-shelf' and relates these types to computer-games. An industry-based simulator is dynamic instructor-supported, while games-based models are dynamic stand-alone. In considering the characteristics of the simulator (instructor-supported or stand-alone) one needs to consider the context in which the simulator will be used. One of the criticisms Goodyear (2002, p.34 in Mayes and de Freitas 2007) levelled at Laurillard's (2002) conversational framework is its lack of regard for what he terms "the key challenges of mass HE" which are chiefly an increasing number of students and decreasing one-to-one time each student has with a tutor. Considering these key challenges for HE, an instructor-supported simulator would

be too tutor intensive. Therefore grounding the choice of simulator in the realities of the teaching and learning context, a stand-alone model would be better suited.

A mix of dynamic and linear virtual product and branching stories simulation model
The level of complexity in dynamic simulation models is higher than those of linear models. As such dynamic models have a higher fidelity but can be extremely difficult and time consuming to create. While some aspects of SRIT require a dynamic simulation, other aspects do not.

Complex experiences, including computer games use branching stories to augment on at least two levels. First they use the techniques for almost all conversations between characters...Second, branching stories can shape high-level strategic decisions a player makes. (Aldrich 2005, p.16)

Branching stories have a lower fidelity, based on a linear model and are more easily constructed than the dynamic models. Additionally most branching story-based (linear) simulators have an inherent advantage over other types of simulator in that the simulator can determine exactly where the user is in the structure and as such it is possible to provide the user with targeted help sensitive to the current context (Aldrich 2005). Finally, the capability of branching stories to construct conversations, (a significant aspect of the interview exchange), and the use of this linear model in conjunction with a dynamic model (virtual product) would seem to be the most suitable approach.

Unpredictability

A key characteristic of a simulation is unpredictability (Schmucker 1999). The simulator would have to be able to deliver a realistic and consistent (albeit simplified) experience that the user would not be able to readily predict. This type of unpredictability within the context of the subject matter would provide experiential opportunities for the user and facilitate repeated use (rehearsal). Rehearsal is key to getting what the user learns into long-term memory, (Gage & Berliner 1998) and facilitates the application and refinement of acquired skills and knowledge.

Unpredictability is determined by the naturally occurring variables that exist within the subject matter. In SRIT for example, variables could include alternative interview locations, different types of background noise/interference, and the varying behaviour or mood of the interviewee. It may be possible to simulate the behaviour of different types of microphones. This could provide experiential

reinforcement of class-based material that has remained conceptual because of the limited physical resources.

Where and how the simulator (artefact) would be used

As already stated, the project's focus is on supporting the learning activities initiated during the third taught session of the module. Therefore the simulator would be introduced during this session and provide experiential opportunities for the student and reinforce the contextual material, tutor demonstrations and student tutor role-play. Given the number of activities already occurring during the three hour session, it would be important for the simulator to be intuitive and easy to use, requiring little or no direct tutor support (the rationale for which is mentioned earlier in this chapter). The tutor should only be required to bring the existence of the simulator to the attention of the students.

To facilitate and promote repeated use of the simulator (practice) students would need access to, and use of, the simulator outside of the taught session. The simulator must support independent learning.

The use of the simulator in both the taught session and during the students' associated independent study time would occur in the same room (see Figure 26 below). Knowing the specific PCs upon which the simulator would be used, negates the need to build in variable application performance settings (as discussed in the artefact review of the games-based flight simulator review, see element 2 in the accompanying supporting creative work). This would help to ensure performance stability and reliability as well as substantially reducing the amount of work and time needed to produce the simulator.

The simulator design would also have to consider the limitations/restrictions of the learning environment in which it would be used. For example, with so many computers in one room, it would be impossible to use speakers to deliver sound. The simulator therefore needed to be designed to enable the students to use headphones only.

Financial constraints would also dictate how the simulator would function. Several of the weaknesses within the module, documented in chapter 3, are the result of financial constraints limiting the amount of physical resources available (such as sound kits). It would be inappropriate if a TSL artefact (simulator) required

substantial expenditure to support its use within the learning space. As such the types of input mechanisms are restricted to the existing keyboard and mouse.

Figure 26 DM1006 - Class and independent study learning environment.



The room contains 25 PCs

The scale and scope of the simulator – (SRIT content)

The scale and scope of the simulator would need to be ascertained through the consideration of the type of learning activities to be included, the production time required to realise the activities as a simulation and the cycle of testing and evaluation opportunities available within the time frame of this research project. DM1006 was delivered at two points in the academic year, October and February. The completion of the artefact, for evaluation, would need to coincide with one or other delivery cycle to facilitate evaluation in the field. It is anticipated that any schedule of work established for the development of the artefact (see chapter 5) would allow deployment and use of the artefact across both semesters in a single academic year.

Learning activities

Preparation was ranked the most important SRIT skill in the survey of providers (see Figure 23, chapter 3). It would be beneficial if the simulator included a mechanism which could support / promote interview preparation.

Reflection was an identified strength within the module and can be attributed to the interview review (transcription) and editing activity, which by the activity's very nature required the student to repeatedly listen to their own performance. Reflection is important in the cycle of experiential learning (Kolb 1984) as well as other constructs of theories of learning including within the context of art and design Schon's (1987a) reflection-in and on-action within the practicum (see chapter 2 - Learning by doing p.25). The simulator if at all possible should seek to replicate these types of opportunity to reflect (both in- and on-action) by providing

the student opportunities to reflect while engaged in activities as well as outside the TSL artefact (experience) by allowing the student to take away a copy of the interview they conduct and record within the simulator.

Providing the student with the audio recording they generated using the simulator would also provide an opportunity to promote practice in audio editing, a learning activity which did not take place within the module.

The limited opportunities to provide tutor guidance / support in equipment familiarisation was an identified weaknesses of the module which contributed to a range of common problems regarding the setting up of equipment by students, such as failing to put batteries in the microphone or minidisk recorder. The simulator should provide the opportunity for guided (coaching) familiarisation with the sound kits (recording equipment).

The simulator would need to promote and develop 'situation awareness' - support interplay between the interview environment (location), recording equipment, a virtual interviewee and interviewer (student).

TSL artefact (simulator) learning and teaching aims

Considering the range of needs, opportunities and drawing upon the observations and considerations thus far outlined in this thesis, the design and construct of the TSL artefact will aim to support/enhance learning and teaching within the week three, 3 hour class by:

1. Creating opportunities to support experiential learning in the classroom.
2. Ensuring that any processes put in place continue to support/promote self-initiated reflection.
3. Reinforcing through experience the need to prepare.
4. Reinforcing through experience the importance of monitoring recording.
(Wear headphones)
5. Providing experiential opportunities to familiarise and explore the use of alternative types of sound recording equipment.
6. Support reflection away from the artefact.
7. Supporting independent study.
8. Facilitating collaborative learning.
9. Providing a cohesive consistent preparatory experience - ensuring a good range of challenges is experienced by all.

The simulator should help address the issue of consistency of student experience identified in chapter 3. By using the simulator the student would be exposed to a predefined group of issues relating to SRIT. These issues are the variables, outlined in the task analysis, (see chapter 3 summary), which provide the unpredictability of experience.

TSL artefact (simulator) design objectives

In realising the aforementioned learning and teaching aims the artefact design will allow students to:

1. Select and use different types of recording equipment (microphones).
2. Set up the recording equipment.
3. Choose different methods of monitoring and monitor recording.
4. Choose alternative interview locations.
5. Choose interview questions and initiate follow-up questions.
6. Conduct an interview (within their pre-selected location, and equipment setup, asking the chosen questions and follow-up questions).
7. Record the interview - (using the pre-selected recording equipment and utilising the monitoring method selected).
8. Take away a copy of the completed interview (audio recording). The recording will possess the characteristics associated with the environment selected, choice of recording equipment and questions asked.
9. Access a variety of SRIT situations and challenges within an interview.
10. Access user-customisable support. Both in terms of engagement with content within artefact and artefact use.
11. Select different levels of difficulty when undertaking an interview activity.

Chapter 4 summary

For this project's TSL artefact to have the potential for success, it must address the requirements of not only the subject matter but also the needs of its intended users. To ascertain these needs it has been important to look both within and beyond the current delivery of SRIT. The process has helped to inform the characteristics and content of the artefact leading me to propose a location-based recording and interview simulator. For simplicity's sake I will refer to this artefact as 'RecordingCoach'.

The aims and objectives outlined in this chapter are addressed and reflected upon in the subsequent chapters of this thesis. In chapter 6 these aims are adapted into six open ended questions as part of an evaluation matrix (see p.146), employed in

the field trial evaluation documented in chapter 7 (see p.152). While a reflection on the artefact objectives is outlined in the summary of the account of the design and production of the TSL artefact (see chapter 5 - 'Compromises', p.140).

In the next chapter I document the design and production of RecordingCoach. In addition to the theories, models and principles discussed in chapter 2, I touch upon further examples drawn upon in the context of the artefact's design, and I discuss some of the tools and procedures employed within the project cycle (see Element 1 p.249 of the accompanying creative works) that informed the design of RecordingCoach.

Chapter 5 - Artefact design and development

In this chapter I outline the design and development process employed in the production of RecordingCoach. I describe the artefact's evolution and outline factors that impacted on the development and final design. Also associated with this chapter are the final artefact and a guided walk-through provided in the accompanying supporting creative work attached to the back of this thesis.

Developmental model

Having already discussed Garrett's (2003) model in the literature review (see chapter 2 - 'A UXD TSL model' p.42), here I return to this model as the framework for the discussion of the development of RecordingCoach. The construct of the five planes - strategy, scope, structure, skeleton and surface - facilitate the breadth of concern and differing perspectives that constitute the TSL design process, which is, as I have argued in chapter 2, a multi- and inter-disciplinary endeavour. Each of the planes and their associated concerns (perspectives) are inter-related. In the design of RecordingCoach there have been many instances where decisions or choices made as a result of testing, reflection and refinement in one plane (phase) resulted in adjustments, refinements or a total rethink in another. This is particularly prevalent after usability and focus group sessions.

User participation

As already stated, usability is widely accepted as a priority in the development of interactive/TSL artefacts (see chapter 2 - 'A common goal - 'usability'' p.41). Another widely accepted priority is user involvement (Preece, Rogers and Sharp 2002; Bannon 1991), a requirement to be 'user focused' throughout the design and development phases. 'Focus' is expressed in a number of forms ranging from 'mindful of' to 'user-participative'. Hughes (2000, p.230) for example suggested, "If you start with a vivid sense of your audience, it will be your guide."

Garrett (2003, p.19) employed the term 'user-centred' design and described how the user is kept in mind throughout each step of the development of a product, a process also endorsed by Endsley *et al.* (2003). While Bannon (1991) suggested users have an even greater role as 'active agents' and offers us 'user-involved', a viewpoint shared by Preece, Rogers and Sharp (2002, p.197). This latter view of 'user as participant' is the approach adopted in this project, and is also in keeping with the 'Action Research' approach this project also employs. (See chapter 6 - 'Research methodology' p. 143 for more on research methods. See also chapter 2 -

'The starting point - a grounded approach', p.53, for a more general discussion about understanding the user and subject matter.)

Focus and usability groups

RecordingCoach was developed over a six-month period between March 2005 and August 2005. During this period, to facilitate input by students and other stakeholders (staff - teachers and technicians), in the development of RecordingCoach, tight production deadlines were established to ensure the availability and participation of students and staff prior to the summer vacation. Between April and June both formal and informal participation in production and testing was sought. Informal input tended to focus on visual design issues, and was in the main elicited from staff (technicians and teachers) while formal sessions were used for focus group and usability testing and included both students and staff (see Figure 27 below).

Figure 27 Student focus group and usability testing session.



From the University of Wolverhampton's Digital Media division, a total of 10 undergraduate students, ranging across all three academic levels were invited to participate in usability testing and focus group sessions. Of the ten, five accepted the invitation and became the project's user testing group. Additionally, a stakeholder session was set up and a total of nineteen staff both technician and academics were invited to participate in an evaluative trial. The data obtained from these sessions was used in the modelling and reshaping of RecordingCoach prior to its field trial. See also 'Margaret's secret, the Easter eggs and goals' elsewhere in

this chapter for more on the usability testing during the development of RecordingCoach (see chapter 6, for a description of the field trials).

RecordingCoach design and production

What follows is an outline of the design and production of RecordingCoach. The process was by no means linear. The development was iterative and cyclical and on occasions jumping from one plane to another. However to aid clarity of presentation, I use Garrett's (2003) five planes (see chapter 2, Figure 4, p.44), starting with the most abstract ascending through the planes as a means of organising and documenting noteworthy decisions, and key milestones.

It may also be helpful at this point for readers to familiarise themselves with RecordingCoach. It is included on the CD-ROM located under Element 9 in the attached supporting creative work. Before using RecordingCoach please read Element 8, installation, systems requirements and disclaimer. (A walkthrough of RecordingCoach including an extensive number of screenshots is also provided within the creative portfolio listed under 'Element 7'.)

Strategy

The project strategy was determined by the identified needs and task analysis carried out in chapter 3 and the aims and objectives as outlined in chapter 4.

Distribution and delivery

In chapter 1, I make reference to WOLF, the University of Wolverhampton's primary technology learning environment, now commonly referred to as a virtual learning environment (VLE) (see also chapter 2 - 'VLE', p.32). Either developed in-house, as is the case with the University Wolverhampton or procured (for example 'Blackboard', developed by Blackboard Inc.), these VLEs commonly distribute and manage TSL artefacts (referred to in this environment as 'objects') via an internet connection and through a web browser. Such environments dictate not only the distribution mechanism (internet) but also the delivery environment (web browser). Performance issues such as access speeds, size of files and technical limitations such as the types of file or data that can be used or manipulated severely constrained the technology supported learning opportunities that could be considered. Because of these limitations, a broader approach was taken and so ideas that were explored and developed through the functionality specification (see 'Scope' below) were used to identify both the distribution mechanism and delivery environment. It is important to note that this exploration and

development did take on board established constraints, such as input devices and computers to host the artefact. (See also chapter 8 - 'Final remarks' p.185)

What emerged was a requirement for both localised content (installed on each host computers hard drive) and remote administration and further content via an internet connection and additionally delivered through a web browser.

Scope

A preliminary functionality specification

Successful multimedia production teams are generally small in size including no more than ten or so members (Hughes 2000) (see also chapter 2 - 'The design and realisation of TSL - a multi- and inter-disciplinary endeavour', p51). To ensure all members are 'singing from the same hymn sheet' a functionality specification is established, maintained and updated throughout the developmental stage of a project. (See Element 1 of the supporting creative work for an example of a production cycle for a TSL artefact.)

In addition to supporting a common understanding across a team, the functionality specification is a documented process that performs three essential functions:

Firstly, it provides an opportunity to scope the functions and features of the artefact based on the identified objectives, as well as introduce primary functions such as how to quit, adjust volume, access help etc. Benyon, Turner and Turner (2005) referred to this as an analysis of functional requirements and suggested it is helpful in providing a more in-depth understanding of an artefact. This process is also helpful in identifying the tools (software), skills and knowledge needed to create the final artefact, and in turn informs the distribution and delivery mechanisms which can be considered (as discussed in the section entitled 'Strategy' above).

Secondly, it provides a kind of 'road map' at the production stage of the artefact, ensuring that no function or feature required is excluded from the artefact as production progresses.

Thirdly, it helps to avoid 'technology creep', also referred to by Endsley, Bolte and Jones (2003) as 'feature creep', a term used to describe the process of modifying or

adding previously unspecified features and functions to an artefact during production. Technology creep can cause a project's workload to spiral out of control and cause a project to fail not only in terms of deadlines but also in shifting away from its original objectives.

Additionally, Barfield (2004) suggests that the specification is an important contractual document between designer and client.

Given that RecordingCoach was the work of an individual and not a team, the functionality specification needed only scope, road map and ways to prevent technology creep and so remains an incomplete document (see Element 3 in the accompanying supporting creative work). The scale and complexity of RecordingCoach quickly emerged through the drafting of the functionality specification. This is best illustrated by the first flow chart developed from this functionality specification (see element 4a in the accompanying creative portfolio and also the 'Skeleton' section below).

Sound

A clearer picture of the range of audio treatments needed within the simulated interview environment was also identified through the functionality specification. To simulate the use of two types of microphone, different states of monitoring (e.g. headphones off, over one ear, over both ears) a minimum of 7 alternative sound treatments were needed (for a breakdown of the treatments see Element 3 in the supporting creative work). Some of the treatments could be manipulated through the computer sound system, such as volume, left and right balance (pan), while others would require the sound to be degraded, such as with microphone distortion which could not be recreated easily by the computer sound system (see also 'Technical performance' later in this chapter). Additionally the ability to generate and take away a copy of the interview recording was also essential to the simulator design (facilitating reflection-on-action and supporting the introduction of the sound software in later sessions).

To facilitate the manipulation of sound and enable real time recording (within the computer), it was necessary to use authoring software and/or plug-ins (software components used with existing authoring applications, also referred to as 'Xtras') which could facilitate this type of audio manipulation. Through extensive research two components were identified which could be used within a single multimedia authoring application, Macromedia Director (now owned by Adobe Inc). The two components identified were 'Audio Xtra' by Tabuleiro and 'ProMix Xtra' by

MediaClick. Both Tabuleiro and MediaClick graciously agreed to make their Xtras available to the project free of charge.

Margaret Weatherby, unpredictability, questions and answers

Within the existing delivery of the module, role-plays involving tutor and student took place. Students were asked to consider appropriate questions around the subject of: 'What's it like to be a vegetarian?' These questions were used as part of the role-play. (See Figure 7 and Figure 8, chapter 3 for examples of students devising questions, and the role-play activity.) By adopting the theme of vegetarianism in RecordingCoach, the work in class could be extended into the virtual environments and would assist the integration of RecordingCoach into the session. Sharpe and Oliver (2007) asserted: "It has long been recognised that technology needs to be integrated into courses in order for them to have an impact on student experience." See also 'La vie en rose' on p.138 later in this chapter for a further example of embedding RecordingCoach into the week three session.

Within DM1006, the tutor assumed the role of interviewee as part of the class-based role-play. Within RecordingCoach the tutor is substituted by a virtual interviewee. In developing the theme of vegetarianism, (as used in DM1006) a virtual character was developed, Margaret Weatherby.

At the same time it also became apparent that users would not be able to formulate their own interview questions but would have to select them from a predefined list. There are examples of computer programmes that simulate intelligent conversation and are commonly referred to as 'chatterbots'. One example is 'Jabberwacky' which can be interfaced with speech recognition software to facilitate audio dialogue exchange between the user and the virtual person, in this instance named George (see Figure 28 below).

Figure 28 Jabberwacky Chatterbot - Copyright 2006 Televirtual Ltd.

However, chatterbots work by responding to keywords and linguistic patterns which over time can become apparent to the user. In considering the use of a chatterbot there were a number of key issues. Integration within the interactive environment; the need to ensure consistency of experience by all users and therefore a requirement to have a structured response, which can highlight and present pre-identified scenarios or problems; and the use of an avatar as the interviewee (see 'Skeleton' section below for more detail), which made a chatterbot unfeasible.

Instead, a script for the interview was developed using the vegetarianism theme and an initial characterisation of Margaret Weatherby (see Element 5 'RecordingCoach script', p.311 in the accompanying supporting creative work). Essential to the interview activity within RecordingCoach was a need to build into the design some degree of unpredictability (see Chapter 4, 'Unpredictability', p. 107). In developing the script a number of ideas emerged to support this.

First, three alternative storylines were developed. These are referred to as discussion streams. These three separate streams could be used to deliver alternative interview experiences, the interview answers having a different focus of response in each path. The three streams are entitled:

1. The Book
2. My Life
3. Vegetarianism

Developing these streams also led to a more detailed development of the character and back-story (history) for Margaret Weatherby. Margaret's back-story now presented her as an author and a controversial figure in the animal rights and vegetarian movement.

The second idea to emerge was that of 'mood'. Margaret's mood should not be static. Four mood states were developed:

1. Closed
2. Guarded
3. Willing
4. Open

Answers to questions while the mood was 'Closed' would be short non-compliant while 'Open' answers would be longer and friendlier.

Mood states were used to provide additional variability in experience but more importantly, they were used to positively reinforce correct or positive performance by the user. This approach can be described as rooted in a behaviourist construct and in particular Skinner's (1974) concept of operant conditioning where a correct action (operant) is rewarded, which in turn leads to what Skinner (1974) termed an operant behaviour. Hill (1997, p.64) pointed out: "...reward following an operant makes the response more likely to occur again." Although behaviourism as a dominant approach is now widely dismissed (Wilson and Mayers 2000 *in* Mayes and de Freitas 2004) it is "...centrally concerned to emphasise active learning-by-doing with immediate feedback on success" (Mayes and de Freitas 2004, p.8). As such the freedom to consider the use of a behaviourist approach as part of a more general mix of theoretical approaches, for example Schon's (1987a) *practicum* as referred to in 'User performance feedback' discussed later in this chapter (p.123), is one that is afforded by the post-theoretical viewpoint this project has adopted (see chapter 2 - 'Borrowing theories - part 1 (learning and teaching)' p.36 and see also 'Scope of the review' p.66).

In RecordingCoach if the user conducts the interview effectively he or she will get a more in-depth interview. Therefore Margaret's mood improves or deteriorates by one increment e.g. from 'Willing' to 'Guarded' if the user performance is problematic.

Three factors determine mood changes in Margaret.

1. Microphone handling (Proximity of microphone denotes a positive or negative shift in mood by one level after each answer.)
2. Responding or not responding to external interference such as a car alarm sounding during the interview. (Pausing or not pausing the interview.)
3. Repeatedly asking the same or similar questions.

A third idea came from the script was the further development of the interview primary and follow-up questions.

Referring back to the activities in the class, a group activity was used to sift through the questions the students had formulated for the role-play. In groups of five or so, students were asked to select the best five questions to ask as part of the

role-play. The activity exposed students to each other's questions, and required them to make a value-based assessment of the quality of the questions, such as: was it a good question, was it open or closed, what would the likely response be etc. While the limitations of technology prevented the user from being able to formulate primary questions in RecordingCoach, it could offer a selection and ask the user to consider, choose some and place these in an order. This would not only provide an opportunity to get the user to make a value-based assessment but also give the user a sense of ownership of the primary questions. The final solution used in RecordingCoach presents the user with ten primary questions from which seven have to be selected and ordered in preparation for the interview.

Listening is a key SRIT skill, and it was the second highest priority in skills development indicated in the provider survey (see Figure 23, chapter 3). In the class-based role-play and as part of the students' assignment activity, they were encouraged to listen to the interviewee's answers and if appropriate consider formulating (on the fly) new (secondary) follow-up questions. This was problematic for RecordingCoach. After consideration, the solution adopted was to present the user with a suggested follow-up question during Margaret's answer to the current question (primary or follow-up). The user then has to make a decision, based on quality of answer and perceived mood of Margaret, whether to continue the line of questioning and ask the offered follow-up question, or move on to another primary question, or possibly repeat the question.

For each of the ten primary questions between three and five follow-up questions were established with associated answers of varying length and detail. To stop a cycle of follow-up questions after follow-up question, Margaret's later responses to follow-up questions suggest to the interviewer (user) that they should move on to a new line of questioning. Depending on which primary question initiates the follow-up sequence Margaret terminates the interview by storming out after either the third or fifth follow-up question. Each follow-up question asked after Margaret's protest contributes to her shifting mood state as discussed earlier.

Structure

Main and submenus

The content of RecordingCoach is organised into three primary areas accessed via the main menu: 'Introduction', 'Practice Menu', and 'Take an Assignment'.

Introduction

Introduction offers an overview of RecordingCoach, and provides an outline of the types of activity and content covered.

Practice Menu

Under the practice menu, users are able to watch a demonstration of a sound kit set up, set up a virtual sound kit and try an assisted interview with the support of a virtual coach.

Assignment

'Take an Assignment' is the area where users can undertake and record a full, unassisted interview with Margaret Weatherby RecordingCoach's, virtual interviewee.

A problem with scale and the practice submenu solution

During the initial development of RecordingCoach it became apparent that the scale of the work to hand (as illustrated by the flowchart Element 4a p.309) far exceeded the time and resources available to complete the work. The scale of RecordingCoach had to be reduced. Reducing the interview simulator to a single location, and fully implementing only one type of sound kit (handheld microphone version) was the most effective way of reducing work load and would effectively half the amount of work needed to be undertaken. The reduction in scale can be visualised by comparing the preliminary flow chart (see Element 4a p.309) with the final flowchart (see Element 4b p.310). In reducing the scale, consideration had to be given to the impact on the aims and objectives established for RecordingCoach (as outlined in chapter 4 pp.110-111). This is one example of where a change required a rethink in one or more of the planes of development and time was spent looking at ways in which the aims and objectives, affected by the removal of different sound kits and alternative interview locations, could be supported elsewhere within the construct of RecordingCoach.

The focus of design thus far had been on the interview simulation as I considered this to be the most technically challenging. It was during the development of several other aspects of RecordingCoach (namely the sound kit familiarisation, content guidance, artefact help and a mechanism to break down the SRIT skills), where the solution to ensure opportunities to experience different types of sound kit and interview location emerged. Both elements could be supported within the 'Practice' area of RecordingCoach.

The 'Practice' area was initially developed to support one of RecordingCoach's aims to 'breakdown complex activities into isolated or clustered tasks as a means of aiding/simplifying skills acquisition'. The original intention for this area was to replicate the main interview 'Take an Assignment', and include some additional features. The primary difference would be the concept of an assisted interview and an associated sound kit introduction and set-up exercise. It was anticipated that the assisted interview would be a shortened version of the full interview simulator. While the full interview would no longer have alternative sound kits and alternative locations, this was maintained and supported in the 'Practice' section. In the 'Practice' section the user is able to select either to use a tie mic or hand held mic, and is given the opportunity to ask two questions and a number of follow-up questions to a second virtual interviewee in a different interview location to the full interview. During this assisted interview, the user is guided through the interview by a virtual coach, who highlights emerging issues (such as microphone noise) that the user is then guided to resolve. The focus of the assisted interview is on sound monitoring, through the use of headphones with the sound kit set-up looked after by a virtual 'coach'. The introduction to the sound kit itself is in turn dealt with separately through two accompanying activities.

User performance feedback

One of the shortcomings of the existing module construct was the lack of opportunity to be able to support a hands-on introduction to the sound recording equipment and an inability to provide guidance or feedback to the student at or around the time they conduct and record their interview. RecordingCoach sought to address this by analysing and responding to user interaction within all the simulated activities. The best example of this is in the 'Practice Sound Kit Set-up' activity located under the 'Practice Menu'. The sound kit set-up activity provides feedback in one of two ways. First, hints are provided during the activity via a 'Hints Pane' which can be optionally turned on or off by the user. This 'Hints Pane' is also available across RecordingCoach and can be turned off or on throughout. Secondly, there is a review of user performance at the conclusion of an activity. The review generates feedback that is tailored to the user by assessing the user's performance based on a combination of 12 variables that exist within the activity. For example, if the user fails to switch on the microphone, in a review of the activity, the virtual coach draws attention to this and suggests to the user they may like to go back and amend the set-up or start over again. Similarly when the user interacts with the microphone the coach hints via the hints pane: 'For the mic to work it needs power and has to be switched on.'

Feedback helps the user learn from their mistakes and successes, facilitating reflection, a key element of Kolb's (1984) cycle of experiential learning and Schons (1987a) practicum (see chapter 2 - 'Art and design pedagogy - educational theory' p.24). Where and when feedback occurs is crucial in facilitating the user opportunity to act upon their reflection. Formative feedback provides more immediate opportunities in an on-going task or activity facilitating what Keeton and Tate (1978) term 'refinement'. Summative feedback aids reflection but does so without immediate opportunities for this to be applied. Gage and Berliner (1998) suggest that constant feedback during practice results in remarkable achievements by people of low ability. The significance of feedback is also identified by Gagne (1985) (see below).

Content guidance and help using RecordingCoach

The absence of guidance to support user engagement with the content, for example where the user should start, was a major failing of three of the artefacts reviewed (see Element 2, p.257 of the supporting creative work).

A clear understanding of the structure and organisation of the content is important in helping the user (learner) make sense of the material, organise their understanding, and retain what they have learned (Gage and Berliner 1998). Gagne (1985) asserted that to arrive at the mental conditions for learning there are nine instructional events that elicit the required internal mental processing. The instructional events are:

- Gain attention
- Inform learner of objectives
- Stimulate recall of prior learning
- Present the content
- Provide 'learning guidance'
- Elicit performance (practice)
- Provide feedback
- Assess performance
- Enhance retention and transfer to the job.

Garris *et al.* (2002, p.461) note: "...instructional games must be carefully constructed to provide both engaging first-person experience as well as appropriate learner support."

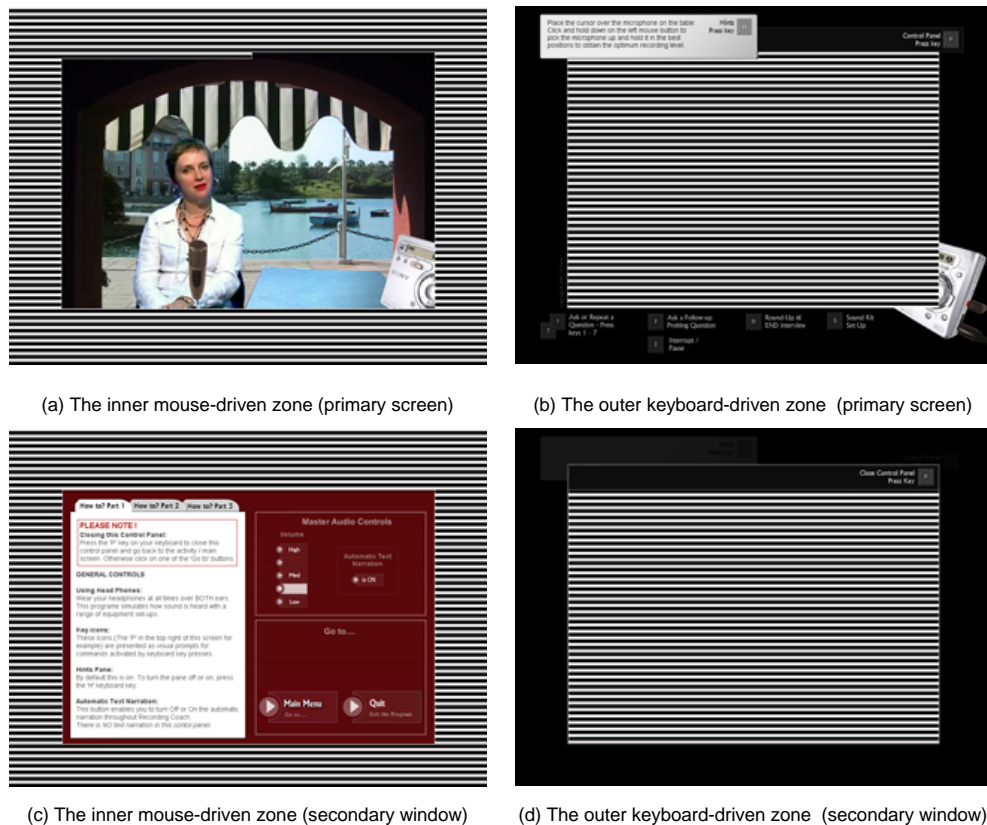
It was envisaged RecordingCoach would be used by students outside the class (independently). Because of this it was felt RecordingCoach should include within its construct a rationale for using the artefact and an overview of its content and the types of activities available. The primary means of delivering this information is via the 'Introduction' which presents nine questions and their associated answers in the form of a 'Q&A'. Some of the Q&As address the content and context of RecordingCoach while others attempt to address questions anticipated by a more familiar user, such as 'How do I end an Interview?' I felt that including both introductory (novice) questions alongside one or two more advanced questions would give the novice user a broader insight into what could be achieved using RecordingCoach. Both the questions and answers were presented in a conversational style in the form of an on-screen video representation of a tutor. This approach was drawn from the personalisation principles discussed in chapter 2 pp.65-65.

A 'help' feature is an explicit means of supporting orientation. A well-designed artefact should allow users to infer meaning and understanding (affordance) (Norman 2000; Cooper and Reimann 2003; Preece *et al.* 2002; Benyon, Turner and Turner 2005) - and should, at its very best, be intuitive to use. In such instances help could be described as transparent and implicit. To this end, every effort was made to make RecordingCoach intuitive to use. In addition to the Q&As in the introduction, further orientation was sensitively embedded within the content. For example, at the start of the sound kit set-up demonstration under 'Introduction' the opening statement explains the existence of the control panel feature. Further orientation was included in this way throughout RecordingCoach. This is further evident in the 'Take an Interview Assignment', where users are introduced to the interview keyboard controls as they work through their preparation for the interview. In addition to the 'orientation help' a global help feature was also developed. This was included to ensure that if a user missed or skipped past any key information, they could access the information at a later time elsewhere within the artefact. This global help feature was developed to exist alongside several other functions (global volume control, auto text narration off/on, menu and sub menu navigation and application quit). This help feature replicated and consolidated the distributed (in context) orientation help scattered throughout RecordingCoach with the aim of supporting individuals who would access maybe only one or two areas either in the initial use or any subsequent use of RecordingCoach.

Microphone, mouse, keyboard and input device zones

Another factor that contributed to the expansion of the help orientation was the emerging need to employ both the keyboard and mouse throughout the interaction design. In places navigation and/or interaction would need to be undertaken by pressing a keyboard key while in other places users would be required to use the mouse. Users would need to be clear about when and where they should use the mouse and keyboard. To aid clarity in the use of the mouse and keyboard the computer screen was divided into two zones, an inner zone and an outer zone for both the primary screen and secondary floating windows i.e. control panel. All activity (interaction) within the inner zone consistently required only the use of the mouse and conversely all outer zone interaction required only the use of the keyboard. (See Figure 29 below)

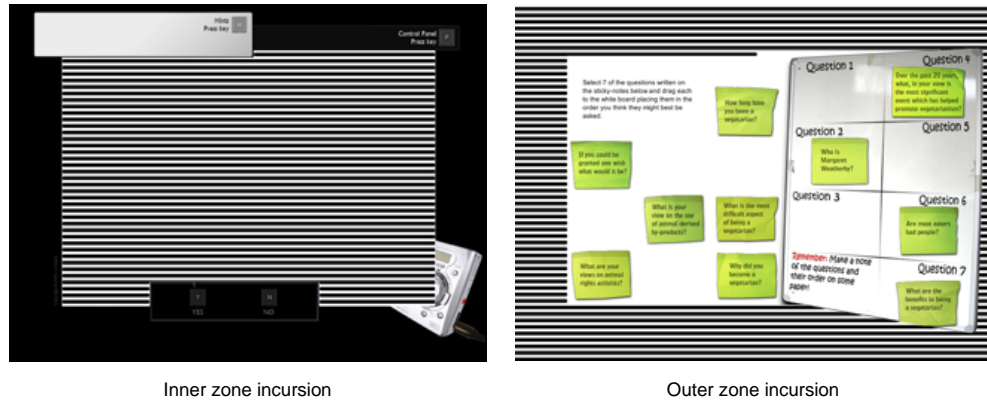
Figure 29 RecordingCoach input interface zones (denoted by the unmasked area).



By maintaining consistency throughout RecordingCoach it was anticipated that users would easily adopt the protocol within a short space of time. Benyon *et al.* (2005) suggested that to help people access, learn and remember the system, both conceptual and physical consistency is important, a view shared by Lidwell *et al.* (2003). Where the boundaries of the two zones overlapped, which occurs on several interface screens such as with the question selection and Margaret's question to the interviewer, (see Figure 30 below), every effort was made to ensure

that it was obvious to the user which input device would be required for the interaction. This was achieved by various means such as the use of colour, proximity and alignment.

Figure 30 Input device zone incursions (denoted by the unmasked area).



The need to use both keyboard and mouse throughout RecordingCoach was driven by the desire to simulate microphone handling and distortion within the interview simulator, which were consistent performance problems for students studying DM1006. The primary problems concerned microphone-handling noise (sound generated from holding the microphone incorrectly) and distortion which resulted from placing the microphone too close to the sound source, a characteristic referred to as 'piping'.

To simulate microphone handling and distortion the user is required to use the mouse to control a simulated microphone throughout the interview, thus making the mouse unavailable for any other function during the interview. The microphone simulates positioning between interviewee and interviewer giving the user visual feedback in terms of proximal screen position (perspective - depth of field) and audio feedback by way of clarity and volume of sound. There are three placement positions simulated:

1. Too close to the interviewee
2. Neutral (the ideal position)
3. Too close to the interviewer (the user - represented as first person perspective).

These are illustrated in the walkthrough, (see element 7, Figure 126 of the accompanying creative portfolio).

Simulating microphone-handling noise was problematic. The original intention was to use both right and left mouse buttons simultaneously held down to grip the microphone in a steady manner. Release of one or other button would simulate a loosening of grip and generate microphone-handling noise. Releasing both buttons would cause the mic to drop. This proved to be unachievable using the authoring software which did not allow the simultaneous use of the left and right mouse buttons. An alternative solution was therefore implemented. Best described as a 'pea in a can' the concept was not to simulate grip but to promote steady smooth control of the microphone placement. As with a pea in the can, if the can (microphone) is moved steadily or held stationary, the pea will not rattle, moved it too quickly and it will rattle. While this solution did not directly correlate with grip control, it would draw attention to microphone handling and control and was felt to be the closest available solution at the time.

Promoting preparation, open-eye.co.uk and Margaret's challenge

As previously discussed, preparation was considered the most important SRIT skill. It would be advantageous for RecordingCoach to expand on preparation beyond the selection and ordering of questions and promote wider preparatory research. This was achieved in a number of ways. Prior to the introduction and use of RecordingCoach, users would be asked to do some background research about Margaret Weatherby. To facilitate this activity Margaret's background and profile (back story) was further expanded and a fake celebrity profile website (<http://www.open-eye.co.uk> password: "coach") (see also Figure 34, chapter 6) was created with an entry for Margaret Weatherby. Users would be directed to this website and additionally a link to the website would be included within RecordingCoach.

To promote (to the user) the validity and value of undertaking background research, an opportunity to challenge the user about their research undertaking was sought. In developing the script, one such opportunity surfaced (see Element 5 p.311 of the supporting creative work). Based on Margaret's mood states and the selection of one of the ten questions, ('How long have you been a vegetarian?'), Margaret responds by asking the user, 'Have you done any research about me?' to which the user must respond either 'Yes' or 'No'. If the response is 'No', Margaret storms out and terminates the interview. If the user responds 'Yes', Margaret then asks a question which can only be answered by viewing the information on the dummy celebrity profile website. If the user answers Margaret's second question incorrectly she storms out and ends the interview. If the question is answered correctly Margaret's mood improves (see 'Margaret Weatherby, unpredictability,

questions and answers' earlier in this chapter), and she answers the original question.

To further enrich this interview scenario an introductory sequence was developed and included in the 'Take an Assignment' section. This introduction contextualises the interview and further reinforces the need for preparation. Jonassen (1998, p.212) suggested: "The representation of the problem is critical to learner buy-in. It must be interesting, appealing, and engaging." The introductory sequence is delivered as a telephone answering machine message from Margaret Weatherby's personal assistant. In the message the assistant (Jane Treemore) reveals how the interview came about and where and when the interview will take place. She also strongly suggests the need to undertake research, directs the user to the open-eye.co.uk web site, provides the site password and tells the listener (user) that the interview time they have will be limited (see also 'The 60 second timer', p.132).

Margaret's secret, the Easter eggs and goals

Testing and evaluation was a continual iterative process throughout the development of RecordingCoach. During one such cycle involving the student focus and testing group several ideas and issues emerged from the presentation and testing of a prototype. As an important part of the iterative cycle of development, prototypes are used to test conceptual models (Endsley *et al.* 2003; Preece *et al.* 2002; Barfield 2004; Benyon *et al.* 2005).

Limited in function and content, the prototype presented to the group demonstrated the main framework for RecordingCoach, its menu structure and a fleshed out submenu (including the demonstration, assisted interview and sound kit set-up activity). However, the simulator 'Take an Assignment' section was very limited in scope and allowed the user to ask only one primary question and the associated follow-up questions.

To facilitate interaction with the prototype (unhindered by its limitations) a testing plan was developed. A testing plan, in its simplest form, provides goals and script or set of tasks (Brown 2006). (See Element 6 p.368 in the accompanying supporting creative work for the testing plan used in this project.) The plan used included a series of authentic activities (activities that would be performed in the final version) represented as a series of tasks the group members were requested to perform, an approach endorsed by Gomoll (1993). Each task had a goal, such as "What is the brand(s) of battery used in the demonstration?" The goal was the rationale for the task which in turn elicited authentic activity / interaction with the

prototype. At the conclusion of all the artefact-based tasks, each testing group member (through the testing plan) was asked a small number of questions. These questions were intended to stimulate reflection of members' experience prior to eliciting opinions, thoughts, comments, criticisms and/or advice.

During a discussion with the group later in the session (see Figure 27 p.114 in this chapter for images of the discussion), the group agreed that a particular goal as laid out in the plan was key to their repeated attempt at the interview task. This task asked the group members to 'get the interviewee to reveal the number of years she had been a vegetarian'. "Goals are not the same as tasks. A goal is an end condition, whereas a task is an intermediate step that helps to reach a goal. Goals motivate people to perform tasks" (Cooper and Reimann 2003, p.12).

Until this point it was anticipated that the primary goal for the interview, in the final version of RecordingCoach, would be to "secure and successfully record an interview with the interviewee." While this challenge would not be simple, (requiring the user to successfully set up the sound kit and work through the interview), once the user had achieved this goal, the question was whether the user would continue to use RecordingCoach. The project was relying on the assumption that the user would find the experience fun, or at least interesting enough to want to use RecordingCoach repeatedly.

The user group's comments were the catalyst to rethinking this assumption, a process which led back to games and games design. It was evident within games design literature that goals are important in games (Koster 2005; Salen and Zimmerman 2004). What makes a game fun, and sustains interest, however, is a very diverse and a much written-about subject. Koster (2005) for example, proposed that fun is, at a basic level, related to the human cognitive propensity to pattern match. Pattern matching is the process of learning and all games are forms of pattern matching. Koster (2005) also suggests that games are in fact teachers, and fun is another word for learning. "The definition of a good game is therefore one that teaches everything it has to offer before the player stops playing" (Koster 2005, p.46).

Also widely acknowledged within the literature on games is an agreement that a clear understanding of goals was a major contributor to the experience of fun. Salen and Zimmerman (2004) also proposed that the game's goal is not the only source of pleasure, it is also derived from the interaction with the game and, more

importantly I feel, the pursuit of short-term (micro) goals. An overarching long-term (macro) goal to win or to lose (in the case of RecordingCoach – to successfully complete the interview or not) is underpinned and supported by micro goals. In RecordingCoach, these micro goals could be considered to be the correct sound kit set-up, competent use of the microphone and effective monitoring of the recording. As Salen and Zimmerman (2004) suggest, it is the completion of these micro or short-term goals that also bring gratification. (See also chapter 7, 'Margaret is the best' for an example of a micro goal established by a student when working through RecordingCoach.)

It became clear to me during the development that the macro goal of completing the interview did not encourage repetition (practice) beyond its successful completion. This meant that opportunities for the user to employ and refine skills could be missed. The resolution for this came in the form of an 'Easter Egg'.

As an aside to the development of RecordingCoach, and just for fun, it was intended to include three 'Easter Eggs' in its final version. 'Easter Eggs' are hidden extras within a programme. For example, Microsoft Excel 2002 has a racing car game accessible via a convoluted sequence which requires the user to open a document, save it as a web page, select cells and click on a logo. One of the Easter Eggs planned for RecordingCoach was the concept of Margaret's secret. The existence of the secret would only be alluded to on the celebrity web site, while nested within the interview would be Margaret's revelation. This would only be accessible during the interview if a number of variables (discussion stream, question and mood state) were met. To reveal the secret would be difficult and require skill in correctly interviewing Margaret and luck in selecting the right discussion stream (a transparent process based on the question ordering activity). To help address the concern for the possible limited scope for encouraging repetition with the 'complete a successful interview' goal this 'Easter Egg' was brought into the main stream of RecordingCoach and Margaret's secret became a parallel macro goal. Because the secret would be difficult to expose, the goal would be presented to the students as an optional challenge. Its inclusion was intended to encourage users who had already successfully completed the interview, to repeat the process in search of the elusive answer and the prestige of being the first in the class to find it. The inclusion of the secret brought to RecordingCoach an element of competition, another concept taken from the consideration of games design (see chapter 2 'UXD and TSL design – a holistic perspective' p.47, chapter 5 'Margaret's secret, the Easter eggs and goals' p.129, and chapter 7 'Value and relevance' p.156).

The 60 second timer

The cognitive foundation for SRIT skills is situation awareness. A key element of situation awareness is time. Endsley's (2000c, p.5) definition of SA clearly illustrates this, "...the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future." (See also chapter 2 - 'Situation awareness and SRIT - 'dynamic skills', p. 62.)

To maintain an authentic experience it was important to exert the pressure of time on the user (in terms of decision making and response) during the interview process. This was alluded to in the message presented to the student by Jane Treemore, Margaret's personal assistant, at the start of the introductory sequence. After Margaret arrives at the interview prior to the commencement of questioning and subsequently after each answer that she gives, a timer runs for 60 seconds (unseen by the user). If the user fails to respond within 60 seconds Margaret terminates the interview by walking out. 60 seconds was chosen for several reasons. First, it took account of the need for the user to become familiar with the interface and interactive mechanisms. Second, it facilitated collaboration between users (see also 'The price of collaboration' below). Third, it provided sufficient flexibility (in essence, customisation) for users with differing aptitudes. Finally, the length of time was adequate to maintain the perception (by the user, who would be preoccupied with the tasks to hand) of fluidity in the exchange.

The price of collaboration

Opportunities for students to collaborate in the module during the initial acquisition of SRIT skills were very limited. Given that collaboration aids the acquisition of complex skills (see also chapter 2 - 'Situated learning' p.28), one of the aims of RecordingCoach is to attempt to rectify the lack of opportunity to collaborate. In the design of RecordingCoach only one concession to the design was specifically made to aid collaboration and this was the 60 second timer as described above. The primary obstacle in supporting collaboration was not with the design of the RecordingCoach but the limitation of the host computers upon which it was intended to run. Users could share the mouse and keyboard but shared audio was not possible. This was overcome with the purchase of a £1.99 audio splitter, which enabled two students to simultaneously connect headphones to the computer and share the stereo audio feed. While this was strictly a purchase of additional resources which I sought to avoid (for reasons mentioned earlier) the advantage outweighed the small cost. (See Figure 34, p.148 for an example of

students collaborating using the audio splitter. See also 'Observing collaboration and peripheral participation' in chapter 7.)

Skeleton

Representing the interviewer

A lot of time was spent considering the type of voice to use to represent the questions the user would ask during the simulated interviews. It was important that users perceived they had control of the interview and were able, based on their choices and interactions, to make decisions and change the course of events. To this end, a synthetic voice was employed to ask the users' questions. I felt that users would accept the ability to control a synthetic voice rather than a natural (human) recording of the questions. A synthetic voice implied automated control.

During usability testing reaction to the use of the synthetic voice was in the main neutral. One user did express an absolute dislike to the use of the synthetic voice, while general comments (by several users) focused on a need to improve clarity in the voice used. In response to the feedback, modifications were made to the voice, in terms of pitch and speed of delivery, prior to inclusion in the final version.

Margaret – avatar or human? Representing the interviewees

While a synthetic voice was felt to be an appropriate representation for the interviewer (promoting the perception of control), based on a number of considerations, this was believed unsuitable for the virtual interviewees. Users needed to perceive the interviewee as responsive, spontaneous (unpredictable). To this end, it was important not only how the interviewees responded but also how quickly users accepted the visual representation. The more sophisticated the visual representation the more sophisticated the users' perception of the possibilities of interaction. This view is endorsed by the observations of Velthoven (2003) in the development of the 'Doors of Perception' CD ROM (see also Element 2, Figure 50, p.263 in the supporting creative work).

Other considerations also had to be taken into account in pursuit of interviewee realism. 'Uncanny Valley' (Mori 1970) is a hypothesis developed in the 1970s by roboticist Masahiro Mori. His hypothesis suggests that when a robot is not human-like, the human-like characteristics stand out and the observer has a positive emotional response to the robot. As the robot becomes more human like there is a point at which the user's perception switches from identifying the human like characteristics to noticing the non-human characteristics, and the observer has a

negative emotional response to the robot. A positive response is only restored when the robot attains true human likeness (Mori 1970). Although the 'Uncanny Valley' hypothesis is disputed (Haywood 2005), it remains widely quoted across both animation (Phillips 2005) and computer games design (Thompson 2004).

Considering Mori's (1970) hypothesis, if the virtual interviewees were to be humanlike, it would be important that the treatment either suggested human-like characteristics or bridge the negative response or 'Uncanny Valley' between human-like and total realism. It was clear in my view from researching chatterbots, 'George' for example (see Figure 28, p.118) fell into the 'Uncanny Valley'. Technical and time constraints were also key considerations in the development of the interviewee visual treatment.

Of the wide range of interactive artefacts looked at as part of developmental research, (see element 2 in the supporting creative work), *Myst IV Revelation* (Foster 2004) stood out through its striking use of video footage to portray the game's central human characters (see Figure 31 below).

Figure 31 Screen shots from Myst IV Revelation (Copyright Cyan Inc.)

The start of the game - arriving with Yeesha

Yeesha with her insane brother Achenar at the game's climax

To achieve the integrated video characterisation, *Myst IV* employed Artificial Life Interactive Video Environment (ALIVE) Technology. ALIVE was chosen by the team to address the 'static' feeling within previous *Myst* games (Gamasutra 2005). The technology allows video footage to seemingly interact with and exist within a 3D rendered computer environment. While it was beyond the capabilities of this project to employ such technology, the principle of video integration was not. Video could provide the realism sought (bridging the 'valley') and also be technically achievable.

A number of exploratory tests were undertaken. Live action video was shot against a blue screen, the background was keyed (café or office scene replacing the blue

background) and these clips were cropped and compressed (see Figure 32, below). This video treatment then formed a key element of one of the prototypes. The treatment was very well received by testing groups. After a number of technical issues were ironed out, the treatment was adopted (see also technical performance below).

Figure 32 RecordingCoach blue screen during final production shoot.



Technical performance

Technical performance was a central issue to emerge from the artefact reviews in Element 2 of the supporting creative works. In particular, video and sound synchronisation was a problem for 'Easy Drums' (Oasis Blue Productions 1999) (see also Element 2 Artefact reviews p.257). To prevent similar issues arising in the development of RecordingCoach, a considerable amount of time was spent testing and fine-tuning performance. Of all of the activities within RecordingCoach the most processor intensive (in terms of computer performance) is the simulation of interviews. The interview simulations require the processing and delivery of a video clip (virtual interviewee) and sound across eight stereo audio channels, which are controlled by, and respond to, user input and interaction e.g. microphone handling and sound kit set-up.

These eight sound channels represent the variable sound conditions associated with SRIT during the interview and include ambient background sound, background noise (other than the ambient sound), mic handling noise and microphone placement. Also contributing to the number of sound channels required was the limitation of the host computer in terms of its ability to process sound (see 'Sound' earlier in this chapter). For example, to simulate microphone distortion (which occurs when the microphone is placed too close to the interviewee or interviewer as they speak) requires distortion of the sound. It was impossible to process sound in this way using the computer hardware during a simulated interview. The final design did however exploit the host computer's

ability to play several sounds simultaneously. The solution utilised requires two versions of the dialogue, one distorted the other clear. Both versions play simultaneously and in synchronisation with the video. The placement of the microphone determines which version of the sound (distorted or clear) the user hears.

Extensive processing of the sound and video files was needed to ensure the host computer could process and smoothly deliver the material. To place this in context, an average commercial music CD has a maximum capacity of around 12 songs, around an hours worth of audio. RecordingCoach also resides on a CD of similar capacity but is made up of 1031 files of which 735 are audio and 251 are video clips. To process and prepare the video clips alone took in excess of 85 hours. It was this painstaking process which made simultaneous synchronised delivery possible.

Instructions and the legacy of user interaction (aiding reflection)

In the design of the interaction for RecordingCoach the keyboard is an important input mechanism particularly within the interview simulation. To aid user's orientation in the use of the keyboard, the commands and keys used are introduced to the user during the preparation and question selection sequence (discussed elsewhere in this chapter). It is important that the need to be familiar with the keyboard controls does not detract from developing SRIT skills within the interview simulation. Miller's (1956) chunking theory asserts there is a limitation to the number of chunks of information (7 plus or minus 2) an individual can successfully recall. These chunks could be for example individual numbers or short two-word phrases. With this in mind it is important to support the use of the keyboard by providing on-screen prompts. The prompts would negate the need for the user to memorise the keyboard commands while the introduction would be used to highlight their existence. The inclusion of the prompts brought with it concern about the number of items needed to be represented on screen within the simulator section. For example:

- Hints pane
- Hints pane control prompt
- Control panel control prompt
- Microphone manipulation in the inner zone area (see Figure 29 (a))
- Virtual interviewee in the inner zone area
- Primary question/repeat question prompts (1 - 7)

- Follow-up question prompt
- Interrupt/pause interview prompt
- Round-up/end interview prompt
- Sound kit set-up prompt
- Minidisk representation
- List of the questions the user had selected

Preece *et al.* (2002) suggested that Miller's (1956) chunking theory has made a big impression on 'human computer interaction' design, but points out that interaction designers frequently misinterpret the theory to mean limiting the number of user-selectable items on an interface to seven. What in fact the theory focuses on is a limitation of memory and not an inability to make a selection if more than seven items are presented. The key difference is that the interface items are ever present while the theory relates to remembering items (chunks) that are no longer present. Concern about the number of items that needed to be presented within the simulator interface therefore came from the limitations of space and clarity of presentation. The solution to this came from the artefact reviews (see Element 2 of the supporting creative work).

The artefact reviews (element 2 in the accompanying supporting creative work), highlighted the concept of enabling users to take away with them some record of their interaction. Artist! (UBI Soft Entertainment Ltd 2003) for example required its users to work in actual sketch pads, 'Seeing Drawing' (Farshad, Shaw, *et al.* 2001) enabled users to print out the simple drawings they created within the artefact's environment. This record aids reflection, an essential aspect of Kolb's (1984) learning cycle (Kolb 1984) and Schon's (1987a) reflection-on-practice, and key to DM1006 (see also chapter 2 - 'Art and design pedagogy - educational theory' p.24). Out of concern for screen space a further opportunity to provide a focal point for reflection away from the computer came about. A large amount of space on screen would be needed to represent the questions the user had selected and organised prior to the interview. Requiring the user to write these questions down on paper would negate the need for their on-screen presentation and additionally provide the user with the opportunity to reflect on their choices and ordering in conjunction with the recording of the simulated interview, which the user is also able to take away (see also chapter 7 'Preparation').

Repetition and skipping

The two parallel user goals of 'secure an interview recording' and 'discover Margaret's secret' are intended to encourage repeated use of RecordingCoach and by doing so facilitate practice of SRIT skills. At the end of the simulated interview users would be encouraged to navigate via the control panel back to the main menu and attempt a new interview. As previously discussed, the opportunity to apply acquired skills and knowledge fosters refinement. To this end, users would be required to repeat the question selection and ordering activity and sound kit set-up as part of each subsequent interview. A skip function was the only concession made for repeated use. The function allows users to interrupt and skip past contextual information such as the interview introductory sequence and introduction to the keyboard controls, which are presented as part of the interview preparation. The skip function is provided throughout RecordingCoach where contextual information (including instructions) is provided. This skip function is part of the rationale for the inclusion of the global help feature previously discussed.

Surface

Taking the functionality and content requirements as a base, a heuristic approach (Preece *et al.* 2002) was taken in the design and development of the interface. The design drew upon principles such as Williams's (1994) 'contrast, repetition, alignment and proximity' (CRAP) principle, Cooper and Reimann's (2003) goal direct design approach and Norman's (2000, pp. 105 - 141) study of what he terms 'slips' or human errors.

Visual design plays an important role in the user experience. This is illustrated by what Lidwell *et al.* (2003) called the 'aesthetic-usability effect'. "The aesthetic-usability effect describes a phenomenon in which people perceive more-aesthetic designs as easier to use than less-aesthetic designs - whether they are or not" (Lidwell *et al.* 2003, p.18). This view is endorsed by the work of Kurosu & Kashimura (1995) who observed a correlation between apparent usability, inherent usability and aesthetics. Norman (2002) also acknowledges the relationship between pleasant, pleasurable aspects of design and the toleration of difficulties or problems encountered by its user.

La vie en rose

"Educational technologies, especially new ones, demand effort and ingenuity in the development of materials, but rarely is this extended to the embedding of those

materials in their educational niche” (Laurillard 2002, p. 199). The music box heard at the end of RecordingCoach was used at the start of the week three session as part of the lecture presentation to demonstrate amplitude and sound propagation. Its inclusion in RecordingCoach was intended to initiate recognition and remembrance of the material covered in the earlier part of the session. This process is called ‘rehearsal’ by Gage & Berliner (1998); it is a process which aids the encoding of information into the long-term memory. The inclusion of this element also further helps integrate RecordingCoach into the week 3 delivery. (See p.118 ‘Margaret Weatherby, unpredictability, questions and answers’ in this chapter for another example of integrating RecordingCoach into the class. See also chapter 3 ‘Week 3’ for more information about the session.)

RecordingCoach – walkthrough

A walkthrough of RecordingCoach has been provided in the supporting creative work attached to the back of this thesis (see Element 7 p.376 of the supporting creative work). The walk-through provides for a greater insight into the various aspects of the artefact, some discussed and others not discussed here. The walkthrough is accompanied by screen shots of RecordingCoach and instructions, should you wish to recreate walk-through using RecordingCoach. (For the final artefact, see Element 8, p.401 and also Element 9, p.403, of the supporting creative work.)

Chapter 5 summary

Drawing upon prior experience

This chapter documented only a small portion of the design and development of RecordingCoach. The formal and informal usability sessions were invaluable in terms of ideas generation, identifying problems, developing and fine-tuning functions and features. Some of the knowledge drawn upon in the development of RecordingCoach comes from over a decade of experience in designing and developing corporate training and educational interactive learning material. Decisions such as text legibility - choice of font, size, line length; the gender of the virtual characters; the importance of harmonised screen text and audio narration (see chapter 2 ‘Modal density’ p.63); conformation and error correction, plus a host of other choices have been informed by this experience. Also contributing to the development of RecordingCoach has been a host of theories, models and principles one of which have been discussed in chapter 2, as well as others outlined in this chapter in the context of the discussion of practice.

Compromises

The objectives set out in chapter 4 – ‘TSL artefact (simulator) design objectives’ p.111 were used to specify the desired functionality of RecordingCoach. However while none of these objectives were abandoned, through the design and development process, several compromises had to be made. Where possible the impact of these compromises on both the aims (also outlined in chapter 4) has been kept to a minimum. For example:

- Because of the implications of the scale of the work required, it was impossible to fully implement the use of different types of microphones. This is also true for the selection of alternative interview locations. However both now reside in a small way within the ‘Assisted Interview’ part of the ‘Practice’ section.
- The issue with scale also impacted on the original concept of the customisable levels of difficulty (see ‘A problem with scale and the practice submenu solution’, p.122). The modification of the ‘practice section’ sought to accommodate a very much reduced version of a customisable level of difficulty.
- Because of the way the recording is generated on the computer, (the computer records all sounds made during the interview rather than just those captured by the simulated microphone), the interview sound recording generated as part of a successful interview with Margaret is only indicative. If the user chooses not to monitor recording (wear headphones) then the recording is completely inaccurate. If the user monitors with headphones over one ear (the method promoted by RecordingCoach) the sound reproduction is correct for only the right channel. It is only when headphones are worn over both ears that the recording is truly accurate.

Having highlighted these compromises, it is worth reiterating that the objectives as set out in chapter 4 have in the main been achieved.

The iterative cycle of development, the need to check and crosscheck how decisions made on one plane impact those on another, is an intensive and time-consuming process for one person. As I have already stated, but will reiterate here, to give a sense of scale to the work, RecordingCoach is made up of 1031 individual files, of which 735 are audio files and 257 are video clips. This figure excludes the hundreds of graphics produced and text-based documents such as the scripts, and

functionality specification (some of which are included in the supporting creative works).

Resources and cost

In the development of RecordingCoach computer software utilised included:

- Macromedia (Adobe) Director
- Macromedia (Adobe) Flash
- Macromedia (Adobe) Dreamweaver
- Macromedia (Adobe) Freehand
- Adobe Photoshop
- Microsoft Word
- Adobe Audition
- Discrete Media Cleaner
- Adobe Premiere
- Apple OSX 10.3x text-to-speech utility
- Apple QuickTime Professional
- Wiretap by Ambrosia Software
- Lingo script from: <http://www.jmckell.com/> (microphone - pea in can concept)
- ProMix Xtra by MediaClick
- Audio Xtra by Tabuleiro.

Hardware included:

- Apple Powerbook G4 (Titanium) 512MB/40GB
- Lacie (external fire wire) dual layer DVD burner
- Dell Inspiron 510m 512MB/80GB
- Panasonic NV-DS30B Mini DV Camera
- Panasonic NC-GS400 Mini DV Camera
- Sony DCR-TRV30E Mini DV Camera
- Agfa SnapScan 2121 flatbed scanner
- Hewlett Packard Deskjet 950c printer
- Lexmark Z65 inkjet printer
- Ricoh Caplio R1 digital camera
- Sony MZ-R700 recording MD Walkman
- Sony ECM-MS907 condenser microphone
- Sony MDR-CD280 Headphones
- Gem Exxa Omni-directional Tie Microphone
- Yoga EM-8 Electret condenser (stereo) tie microphone
- Various tripods

- Light kit 3 x Redhead spots
- Various cables and leads.

In addition to the above resources, factoring in the actual overheads such as dedicated office and studio space, (actor/actress) performance fees, consumables such as DV tapes, CD-ROMs, paper etc, as well as the notional cost of development time (people hours) the estimated cost (prior to evaluation) of producing RecordingCoach was approximately £120,000. By comparison the development of Seeing Drawing (see Element 2 of the supporting creative work) cost £300,000 funded by the Higher Education Funding Council of England (HEFCE).

The following chapter outlines the project's research methodology and describes the field trial of RecordingCoach that took place over an eight-month period from October 2005 to May 2006.

Chapter 6 - Research methodology

This chapter describes the research carried out using RecordingCoach, the framework for evaluation and the field trials outlining the data capturing tools used and approach to data processing.

Research approach

This project has taken an action research approach to its investigation. Action Research, the origins of which are attributed to Kurt Lewin (Smith 2001b; Cohen *et al.* 2006; Ferrance 2000) is a cyclical, iterative process of identifying problems and finding solutions within real world situations. Ferrance (2000, p.2) stated: "Implicit in the term action research is the idea that teachers will begin a cycle of posing questions, gathering data, reflection, and deciding on a course of action."

Action research is commonly employed in a number of contexts. Smith (1996) identified the two most prominent of these: the British tradition of action research linked to education and orientated towards the enhancement of direct practice; and a North American tradition of the application of action research within the social welfare field. Bell (2000, p.10) asserted that: "Action research is not a method or technique." Action research is an approach with a practical problem-solving emphasis and is particularly appropriate when a new approach is grafted on to an existing system (Bell 2000). A central characteristic of action research is the position of the researcher to the setting / subject under investigation. For example, qualitative researchers typically want to be flies on the wall, observing and not participating or contaminating the 'naturalistic' inquiry (Herr & Anderson 2005). This type of approach would be that of an 'outsider'. However, based on the nature of the investigation, action research researchers can adopt a single position or combination of positions. Within the context of this project, I am both a teacher within the context of DM1006 and researcher investigating the effectiveness of TSL. This duality of roles places me as an insider and outsider. "Much action research is centrally concerned with these issues of the relationship between outsider and insider, since clarity about them is necessary for thinking through issues of research validity as well as research ethics" (Herr & Anderson 2005, p.29).

The duality of roles and my position within the setting has been a major consideration during the development of the research. A particular focus has been given to integrity of the teacher role, teaching experience and validity of the data (see 'Validity' p.151 towards the end of this chapter). While Cohen *et al.* (2006) also identified the importance of consideration for the researcher's position in the

research process they also suggest that action research offers rigour and authenticity and is situationally responsive. The action research approach draws upon a range of research tools and methods appropriate for a given situation. Within the context of this research the ones that have been employed are outlined below.

Further consideration of research methods

In determining the research methods to employ within an action research approach, it is essential to be clear about what is being evaluated, where that information resides and how best to collect / extract this information. To this end it was helpful to reflect on the research questions as a starting point in clarifying the matter of what is being evaluated.

Outstanding research questions

- 1) Main question - Can TSL aid the acquisition and development of practical skills associated with sound recording a location-based interview, introduced (as part of studio-based practice) during a three-hour class to level 1 undergraduate art and design students?
- 2) Secondary question - What factors relating to the design of the TSL artefact either enhanced or impeded skill acquisition?

Because there was no SRIT skill-focused TSL artefact in existence at the time of this research, RecordingCoach was conceived, built and deployed as a teaching and learning aid in the delivery of DM1006 to facilitate this project's goal. In support of the design of RecordingCoach a diverse range of theories, models and principles across a number of domains were explored. Two key domains were SA and simulators. Within the context of evaluation these were reflected upon as a means of helping to inform methods of evaluating RecordingCoach. The plausibility of interpretation of research data hinges on the explicit articulation of inference (Oliver *et al.* 2007). As such Oliver *et al.* (2007, p.31) suggested that one aspect of good research practice is the "...openness about the assumptions made and the process through which claims are legitimated."

Simulation evaluation issues

"One of the major problems of simulations is how to evaluate the training effectiveness" (Hays and Singer 1989, p.193 cited in Feinstein and Cannon 2002, p.425).

Feinstein and Cannon (2002) assert that the evaluation of simulators has failed to hold itself to a common scientifically acceptable methodology and suggest that this is in part due to an unclear taxonomy and a number of differing concepts employed in simulator evaluation. Feinstein and Cannon (2002) attempt to address this through the unification of evaluation concepts (as identified in much of the literature on simulation evaluation) and place these concepts within the construct of a framework. The framework is based upon three evaluation foci: fidelity, verification and validation. Fidelity is concerned with the degree of realism the simulator exhibits. Verification evaluates whether the simulator operated as intended. Validation is both 'representational' and 'educational'. Representational validity asks, "To what extent does a simulation game accurately represent the desired phenomena?" Educational validity asks "to what extent are students' decisions influenced in the intended manner by the game design? (Feinstein and Cannon 2002, p.435). This research does not seek to address this problem but reflecting on the framework did serve to draw attention to different aspects of simulator evaluation. Based on Feinstein and Cannon's (2002) framework the first aim of this project centres on educational validation. The second aim draws additionally upon 'verification' and 'representational validation' (study of the simulator).

Measuring situation awareness

"To search for the universal measure [for situation awareness] is to search for the Holy Grail. Rather, an investigator must make a judicious choice of the measurement context together with the appropriate choice of measures" (Pew, 2000, p.45).

As previously stated, SA is concerned with three levels of cognitive processing, level 1 perception, level 2 comprehension and level 3 projection (Endsley 2000c). Most of the approaches to the measurement of SA are discussed within the domain of avionics however a central issue for SA measurement is that of authenticity of the situation and consideration for disruption in SA caused by measuring it. Approaches to the measurement of SA include the 'Situation Awareness Global Assessment Technique' (SAGAT) which is based on an approach which seeks to freeze a moment in time and question an operator about their perceptions of the situation (Endsley 2000a). Bell and Lyon (2000) on the other hand offer an objective-based approach to the evaluation of SA through instructor pilots (teachers) and other subject matter experts. Another approach employs reflection and includes the review of critical incident reports (Klein 2000) and self reflective subjective measurements (Jones 2000).

Two of the techniques for measuring SA (mentioned above) are not dissimilar to the assessment methods that were employed in DM1006. For example, objective-based measurements made by the teacher and the reflection as carried out by students echo Jones's (2000) self-reflection and instructor-based objective evaluation (Bell and Lyon 2000). The assessment of assignment performance could therefore contribute in part (SRIT is not exclusively about SA) to the evaluation of the use of RecordingCoach to acquire SRIT skills.

Evaluation matrix

Unfortunately, there is no 'magic bullet' which will tell you simply and easily that a certain application of ICT has had an effect on student learning. Indeed, we can't evaluate ICT in isolation - we have to look at student learning in the teaching and learning environment as a whole (Phillips, 2002, p.1).

Phillips (2002) also suggested that when evaluating the impact of ICT (TSL) it is preferable to focus not on the research methodology but the questions to ask and suggested the use of an evaluation matrix (see Figure 33 below).

Establishing some evaluatory questions

Beyond SA other aspects of SRIT had been identified as part of the task and needs analysis (see chapter 3 Figure 24 p.100 and Figure 25 p.102 for a summary of each). All of these elements were consolidated into a set of aims and objectives to inform the design of RecordingCoach (see chapter 4 'TSL artefact (simulator) learning and teaching aims' p.110 and 'TSL artefact (simulator) design objectives' p.111). Therefore the starting point in establishing a set of general questions for the evaluation started with a consideration of these aims and objectives. This resulted in the establishment of six preliminary open-ended questions that sought to cover the subject matter SRIT, learning and teaching and the learning environment (see Figure 33 below).

Figure 33 Preliminary evaluation matrix

Project questions: Can TSL support SRIT skill acquisition? What factors impede or extend SRIT skill acquisition?									
Questions	Prior Assignment Performance	Expectation Survey (N&TA)	Evaluation Survey (N&TA)	Expectation Survey (Field Trial)	Evaluation Surveys (Field Trial)	Current Assignment Performance	Observation	RecordingCoach Activity log	Semi-structured discussion group
How is assignment performance affected?	+	+	+		+	+		+	
What behavioural changes occur?			+		+	+	+		+
What perceptual changes occur?		+	+	+	+				+
How does the learning experience differ?	+	+	+	+	+	+	+	+	+
How was RecordingCoach received?					+			+	+
What factors in the design of RecordingCoach impeded or extended SRIT?					+		+	+	+

Data collection methods

In addition to the students' assignment performance, and based on the preliminary questions posed in the evaluation matrix (see Figure 33 above), a number of methods were employed, at different times throughout the field trial, to capture relevant data. This included data pertaining to attitudes towards RecordingCoach and patterns of learning activity. A further consideration in the choice and range of methods used was based on a wish, during the evaluation, to draw upon the opportunities and validation afforded by data triangulation. Cohen *et al.* (2006, p.112) define triangulation as "the use of two or more methods of data collection in the study of some aspect of human behaviour" and affirms that contrasting data collection methods within the domain of human behaviour provide better validity. This view is also shared by Phillips (2002). To facilitate methodological triangulation (Cohen *et al.* 2006) and support the preliminary questions posed, the range of data collection methods used included:

- Two administered surveys
- Automated artefact activity log
- Four semi-structured discussion groups
- Discreet observation
- Conventional assignment assessment

Existing data captured by this project as part of the needs and task analysis (see chapter 3) was also retained to aid evaluation. This included the 'Cohort profile - prior experience and module expectations' (appendix 3a, p.196); 'evaluation reflection practice resources' survey (appendix 3b, p.198) and student grade

attainment in DM1006, as well as historical data pertaining to prior student attainment on the module.

Additionally anecdotal data also emerged from informal observations made by technical support staff and unprompted independent comments by a number of participating students.

RecordingCoach field trial

Over 8 months (Oct 2005 - May 2006) RecordingCoach was deployed in five iterations of the module to a total of around 120 students. Qualitative and quantitative data was collected using the methods outlined above at different intervals across the field trial.

Figure 34 October field trial - week three session, final hour.



Animation Students using RecordingCoach



Collaboration



Collaboration

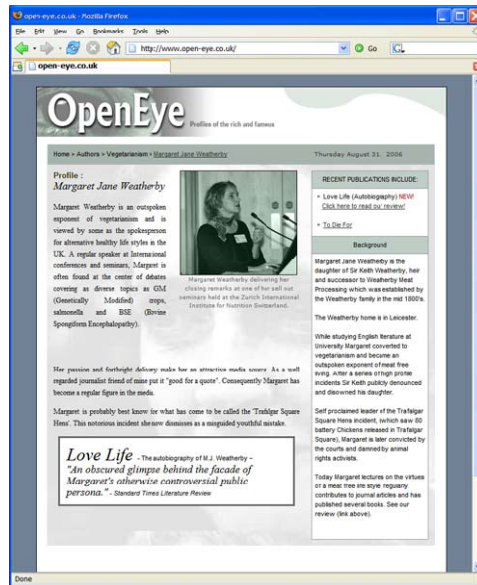


Tutor responding to student request for assistance

Introducing RecordingCoach

At the end of the week two class, students were informed that they would have an opportunity to interview a celebrity the following week and were advised to undertake some background research. The group were directed to a web site <http://www.open-eye.co.uk> (see Figure 35 below) and given a password ("coach") to enable them to access the pages for 'Margaret Weatherby'.

Figure 35 Open-eye.co.uk - dummy celebrity website.



RecordingCoach was introduced to the students in the final hour or so of the following week (week 3) after the pre-existing class-based activities had been completed (see chapter 3 'learning and teaching activities weeks 1 to 7'). The introduction revealed 'Margaret Weatherby' to be a virtual interviewee and gave a brief overview of the artefact, and highlighted the need to have a pen, paper and headphones and also directed students to the location of RecordingCoach on the host computers. Students were invited to work on their own or in pairs (see Figure 26, chapter 4 for an illustration of the learning space). Students were additionally made aware of the availability of access to RecordingCoach outside of scheduled class time and were given the two goals. The first goal was to acquire a recording of an interview with Margaret Weatherby by the start of the following week's class. Students were informed that the recording they obtained would be used as part of the introduction to the sound editing software. They were also challenged to try and find out Margaret's secret (the second goal).

Individual and pairs of students then worked through RecordingCoach. During this time requests for assistance were student-initiated (with no tutor-instigated intervention). Any problems encountered by students were responded to and documented (see the subheading 'discreet observation' below).

Collecting the data

Administered surveys

The first of the two surveys, the 'cohort profile prior experience and module expectations' (see appendix 3a), was administered in the first three weeks of the

module's delivery. The second survey was an expansion on the 'evaluation reflection, practice resources' survey (see appendix 3b) and included additional questions intended to elicit information regarding the students' experience of RecordingCoach (see appendix 5). This second survey was administered in week seven at the point of the submission of the first assignment (see appendix 1a). Both surveys captured quantitative and qualitative data.

Discussion groups

At the conclusion of the module, in four of the five classes, which ran across the year, a small number of students were invited, at random, to participate in a 20 minute discussion about their experience on the module and their use of RecordingCoach. Each group was limited in size to around six participants. The discussion took place in a tutorial room adjacent to the primary teaching space. Refreshments were provided to promote a relaxed informal atmosphere and students were encouraged to be frank and direct. In each group, discussion was steered around six loosely defined questions and three agree/disagree statements (see appendix 6).

Activity log

Each time RecordingCoach was started, the date and time were recorded and primary and submenu selections were also recorded along with the time of each selection. The 'exit' or 'quit' time was also documented by RecordingCoach. To attribute this data to individual users, at the start of RecordingCoach, students were asked to enter their unique student identity number. This number was used both to name the audio files created through RecordingCoach as a part of the interview exercise and to distinguish the different usage patterns documented and stored as a text file on the host computer. (See appendix 7 for an example of the activity logs.)

Discreet observation

During the RecordingCoach introductory session, walking around the room or sitting at empty tables, I discreetly observed (and took notes of) student interaction with RecordingCoach and with each other, (see Figure 34 for an example of the introductory sessions from semester one). I noted any questions raised or difficulties encountered by the students, animated interactions between paired students or individuals. I also documented a number of spontaneous remarks and requests made during this time. (For example, "Can I have a copy to put on my computer at home?").

Assignment assessment

Assignments were assessed as normal using the criteria established prior to the introduction of RecordingCoach (see appendix 1b). Assessment took place over a two-week period (weeks 7 and 8) in each semester (see also 'Validity' below).

Data processing

SPSS v11.5 and Microsoft Excel 2002 were the two primary computer programmes used to process, analyse and present the collected data.

Validity

To ensure the integrity of the assessment of student performance in the assignment (see above), and mindful of the position of myself as researcher in terms of action research, all research data collected including information from both surveys and the activity log usage patterns, were neither studied nor processed prior to the assessment of the first assignment. The discussion groups were also held post-assessment for the same reason.

In the next chapter, within the context of this research project's aims, I analyse and evaluate the field trial data and reflect on the design and production decisions in light of the findings.

Chapter 7 - Field trial evaluation – data analysis

This chapter looks at the data obtained during the field trial of RecordingCoach. It considers both quantitative and qualitative data collected pertaining to the students' learning experience, attitudes and behaviour towards the assignment-based activities and assessed attainment and reflects on the design of RecordingCoach based on the designs aims and objectives established in chapter 4.

Scale and format of evaluation

108 students participated in the trial across five iterations of DM1006. A complete set of data (expectation survey, evaluation survey, and RecordingCoach activity log, submitted and assessed assignment) was obtained for 83 of these students.

Where to start?

One of the best-known training evaluation methodologies is Kirkpatrick and Kirkpatrick (2006), which uses four levels of training evaluation (Clark 1995; Kruse date unknown). Level 1 evaluates the reaction of the trainees; level 2 focuses on the learning (attitude, knowledge and skills); level 3 is an evaluation of the trainee after they return to their workplace and occurs, ideally, some months after the training; level 4 evaluates the impact training has had on the trainees' organisation. While this methodology was not suited to the context and scope of this project, Kirkpatrick and Kirkpatrick (2006) do offer one essential piece of advice recommending that level 1 and level 2 should be evaluated before attempting to evaluate the final workplace performance (level 3) or its impact on the organisation (level 4).

Suppose, for example, that you evaluate at level 3 [workplace performance] and discover that little or no change in behaviour [performance] has occurred. What conclusions can you draw? The first conclusion is probably that the training program was no good...This conclusion may be wrong. (Kirkpatrick & Kirkpatrick (2006, p. 71)

With this advice in mind, the most obvious question: 'How is assignment performance affected?' will be looked at towards the end of this chapter.

The evaluation is organised into five elements based on the six questions that were part of the preliminary evaluation matrix (see chapter 6 Figure 33, p.147). These elements include:

1. How was RecordingCoach received?

2. How does the learning experience differ?
3. What perceptual/behavioural changes occur?
4. How is assignment performance affected?
5. What factors in the design of RecordingCoach impeded or extended SRIT?

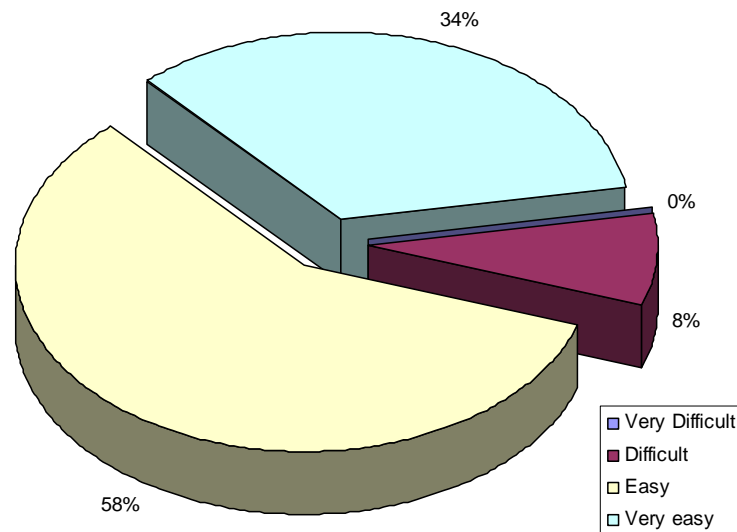
How was RecordingCoach received?

In determining the students' response to RecordingCoach, the field trial sought to capture data relating to the artefact's ease of use, stability, the students' perception of the artefact's relevance, helpfulness and value as well ascertaining whether or not the students found the experience enjoyable.

Ease of use

92% of students found RecordingCoach easy to use. Of those who found it easy, 34% indicated it was very easy. While 8% of students had difficulty, none found it very difficult.

Figure 36 RecordingCoach ease of use - percentage of users.



Field trial RecordingCoach introductory session observations

Observations documented during the introduction of RecordingCoach noted an initial problem that some students had.

Thirteen students across the trial year commented during the session that the audio (volume) controls within RecordingCoach did not allow the volume to be raised high enough. This same issue was mentioned by two of the discussion group members. To rectify the problem during the session required the student/tutor to override RecordingCoach control of the host computer's audio

settings by using the 'ALT+TAB' key combination to briefly access the computer desktop settings and adjust the PC system volume. Interestingly during usability testing (see also chapter 5) the consensus of the groups were that the audio levels were in fact too high. In response, adjustments were made to the audio settings of RecordingCoach during its final development, prior to the field trial. However during the field trials one student did indicate that the sound level was too high. This helped to pinpoint the cause of the volume issue which turned out to be a problem with a particular make and model of headphones. These same headphones had also been used by the usability testers. While a considerable amount of time went into the design of RecordingCoach to ensure sound levels were comfortable and could be adjusted by a user, it was not anticipated that similar models (closed and open back headphones) by different manufacturers would be substantially different in terms of the volume of sound. Rectifying the problem for this student required a similar manipulation of the PC sound through the desktop settings as previously described.

Stability

The artefact reviews (element 2 in the creative supporting work), and in particular, the failure rate for the programme (40% - 100%) of 'Seeing Drawing' made the stability of RecordingCoach a central concern. Across all five introductory sessions of RecordingCoach, there was only one reported instance of instability. It is unclear why the programme froze, but a complete system reboot was required. The need to reboot may indicate the problem resided with the computer and not RecordingCoach. After the reboot, the issue did not occur again. The evaluation survey identified two further instances of instability problems with RecordingCoach. Based on the number of times RecordingCoach ran (recorded by the activity log) the failure rate was less than 2%. None of the students who indicated some difficulty in using RecordingCoach (see 'Ease of use' above) experienced instability issues.

Helpfulness

The perception of the helpfulness of RecordingCoach was explored in both the evaluation survey and discussion groups. Of the 98 students who responded, only one student felt that RecordingCoach was not helpful. The activity log indicated that this student did not attend the class in which RecordingCoach was introduced and further investigation revealed that the total time spent using RecordingCoach by this student was only 10 minutes, which I would suggest is insufficient time to adequately experience the range of elements contained within the programme.

The discussion groups were asked: "Was RecordingCoach at all helpful?" Here are some of the responses:

It was helpful and funny. I found it useful because I went very nervous and I forgot to put the batteries in; I think if I hadn't had got that practice I think I would have gone completely blank. (Student 'A' discussion group 1, - 17/11/2005)

I find it useful because it got you used to handling the equipment knowing what you were meant to do with it - to put it together its like 'ah that makes sense' when you got it [the sound kit] you didn't sit there thinking which bit goes where. It was also useful for getting an idea of what sort of questions you should be asking. (Student 'B' discussion group 1, - 17/11/2005)

It's useful, you have a diagram of the minidisk and you have to plug everything in. When you go out that's a fundamental problem you think shit why is it not working? I was thinking back to the imagery [within RecordingCoach] and plugging all the plugs in. Another thing I liked was asking a question and a follow-up question, and if you put this into practice in your interview you get good results. They are the two things I got out of it. (Student 'B' discussion group 2, - 17/11/2005)

I thought it [RecordingCoach] was fantastic it taught me a hell of a lot, about four or five times I went through it. It was a big help to me. (Student 'A' discussion group 3, - 09/05/2006)

I think it's good because it's interesting and if you are doing something it sticks in your head more rather than if you were just stood at the front and told us every thing, you may switch off or not listen or forget what you have said. (Student 'B' discussion group 3, - 09/05/2006)

I found it really useful because I have never used a minidisk before either. (Student 'E' discussion group 3, - 09/05/2006)

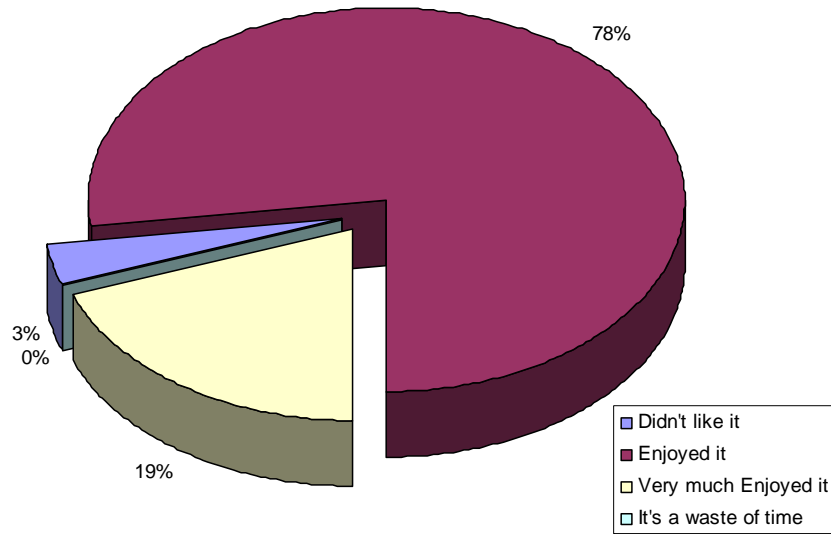
It helped me I didn't know anything about a minidisk so I found it quite useful to work with. (Student 'F' discussion group 4, - 12/05/2006)

Enjoyment

Across the discussion groups it was agreed that RecordingCoach was enjoyable to use.

I know it sound lame but I thought it was fun. It was different I thought the whole idea was clear. (Student 'E' discussion group 3, - 09/05/2006)

Figure 37 Percentage of students who enjoyed using RecordingCoach.

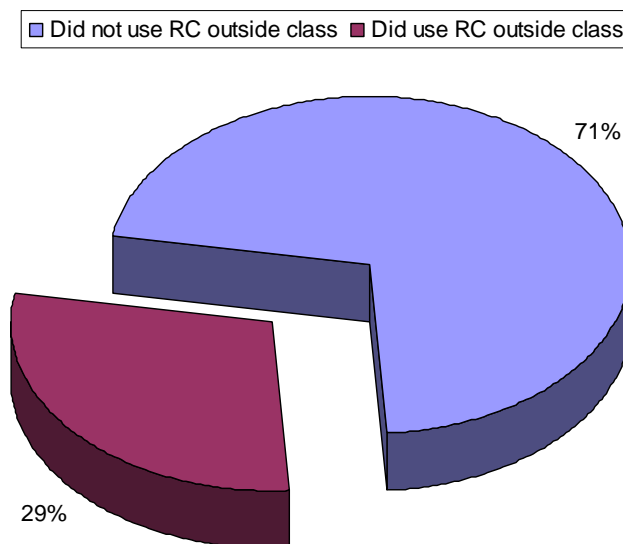


19% of students said they very much enjoyed using RecordingCoach and a total of 97% of students indicated that using RecordingCoach was enjoyable. Of the 3% that did not enjoy RecordingCoach, 2% also found the programme difficult to use.

Value and relevance

The number of students which used RecordingCoach outside of the scheduled class time was fewer than anticipated (see Figure 38 below).

Figure 38 The percentage of students who used RecordingCoach outside scheduled class time.



To try and ascertain why this was the case, these findings were explored with the discussion group. This was a particular challenge with regard to my dual role as teacher and researcher (see also chapter 6 Research methodology). In my

experience students give weight to how they are perceived (or think they are perceived) by their tutor. Seeking to understand the low use of RecordingCoach outside of the class meant that the students would need to reveal how much or how little they had engaged with DM1006, which they might have been reluctant to do as it may, in their view, affect my (as teacher) perception of them.

To ease into the topic of 'where and how you studied', each of the discussion groups were asked if the module could be studied via distance learning using the teaching support web site material (Jim.org.uk - not part of this project's study) and RecordingCoach. Three of the four groups unanimously stated that the module could not be studied via distance learning. This indicated that the students were aware of the need to attend and engage in class-based study.

It's about how you speak and teach in the class, it's very easy to remember things when you are shown things, when you make the joke of 'Mickey Mouse'. The jokes help you to remember. (Student 'A' discussion group 1, - 17/11/2005)

The fourth group answer was a collective 'probably' with individuals adding "but coming in was more interesting", and "you gained more information in the class". This difference of opinion expressed by the fourth group may be related to the fact that a large proportion of the students in this group registered late for the module and as such missed the first two weeks of the module. Other questions posed to all the groups eventually established that most of the students spent very little time studying outside the class, for all modules across their study, unless the work was for an assignment with an impending deadline. When asked whether this was the reason why RecordingCoach was not used outside class the consensus was that RecordingCoach had been used sufficiently in the class and did not warrant further use.

It's sort of I've done it, I never have to do it again. (Student 'D' discussion group 1, - 17/11/2005)

I thought it was good, I don't think if you are more advanced, you know, if you have done it once, I would not want to use it again now because I know what to do on it sort of thing. But It's sorted me out proper because I know what to do. (Student 'C' discussion group 2, - 17/11/2005)

It teaches you how to use it, when you have got the knowledge you do not need to go back to it. (Student 'E' discussion group 3, - 09/05/2006)

Also identified as contributing to the limited use of RecordingCoach outside class, was the lack of alternative interviewees and interview locations. The locations

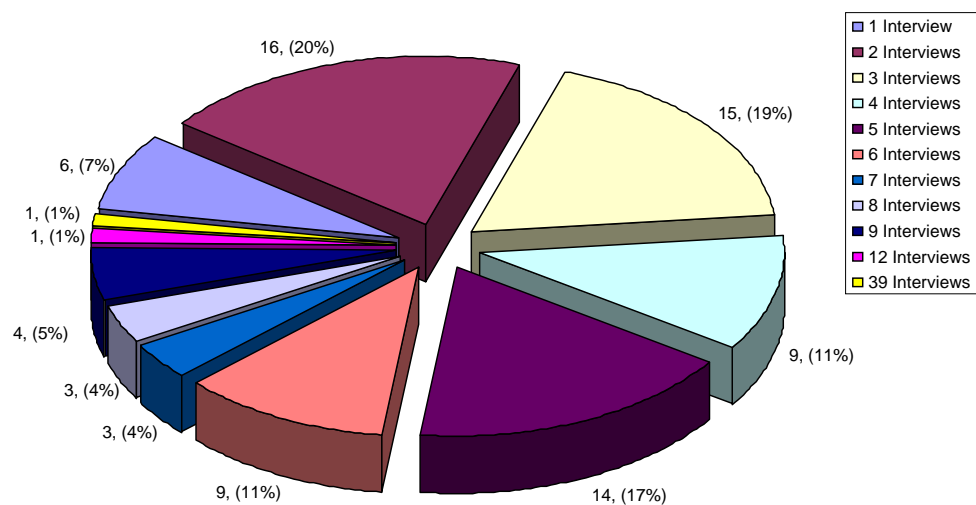
feature of the artefact was limited to the 'Practice' section during the design and development. (See 'A problem with the scale and the practice submenu' chapter 5.) While use of RecordingCoach outside the class was limited to 29% of students, the longer term benefit of being able to revisit RecordingCoach was acknowledged by 80% of students in the evaluation survey (see appendix 5) who indicated they would like future access to RecordingCoach in support of future sound based module study at level 2 and 3. Additionally, numerous requests for personal copies of RecordingCoach were made by students during the introductory sessions. In one session there were seven separate requests, equating to 25% of the class.

To try and determine if RecordingCoach's helpfulness, ease of use, and enjoyability were perceived as valuable by students, each were asked in the evaluation survey: 'Should we use RecordingCoach with students who study this module next year?' Even though 8% of the students had some difficulty with RecordingCoach, and 3% did not like using it, all students responded 'Yes' to this question.

Usage

93% of students interviewed Margaret two or more times. In one instance a student interviewed Margaret a staggering 39 times (see Figure 39 below).

Figure 39 The number of simulated interviews conducted by students with Margaret (number of students, percentage of cohort).



In total there were 375 simulated interviews documented by the activity logs and a total of 3,450 minutes of simulated interview activity recorded with Margaret Weatherby. RecordingCoach was used for a total of 5,507 minutes across the field trial. The least amount of time spent using RecordingCoach by a student was 8 minutes, the greatest 412 minutes with an average of around 70 minutes per student.

How does the learning experience differ?

In looking at the learning experience I wanted to see if there was any indication that the introduction of RecordingCoach changed the way students felt about the learning opportunities they had in DM1006 and level of support they received.

The class-based activities as a preparation for the assignment and sound kit availability

A comparison of the 2003/04 and 2005/06 cohort 'evaluation, reflection, practice and resources' surveys (see appendix 3b and appendix 5) indicated there was no difference between the two cohorts' reflections regarding time available to practise with the sound kit. Furthermore, when asked to consider the adequacy of the class to prepare them (the students) to undertake the assignment, there was only a 1% improvement in the perception of the students who used RecordingCoach.

The module has always been very well received by students. This is in part due to the way it is taught, including a large degree of audience participation, humour (see the student comment about jokes under 'Value and relevance' page 109) and the use of a variety of supporting audio-visual material. Identified as part of the needs and task analysis and through my own observations as the module tutor, the lack of assignment preparation by students and difficulties faced by the teacher in supporting the assignment were not perceived by the 2003/04 pre-RecordingCoach cohort, with 94% of students believing they were adequately prepared. This made a 'before and after' comparison problematic. What the comparison did however show was that the use of RecordingCoach did not have a negative impact on an already positive perception of support.

Through the discussion groups a number of statements were presented to each group which did bring to the fore an appreciation of the role RecordingCoach may have played in preparing them for the assignment. This is looked at under the heading 'Attainment' later in this chapter. (See also 'Attainment' p.165 later in this chapter for more on the role of RecordingCoach in aiding preparation.)

Observing collaboration and peripheral participation

It was evident through observing the students using RecordingCoach that there had been new opportunities to collaborate and share SRIT-based experiences (see chapter 6, Figure 34 for photographs of the session and students working together). In two of the five sessions, collaboration occurred because of the need to share computers, while across the other three sessions some students chose to work together even though there were sufficient facilities for students to work alone. Collaboration was not limited to exchanges around a single computer. Frequently, students sitting adjacent to each other would confer and this included amongst other things discussions about the sound kit set-up, which questions to select, why the microphone was not picking up sound and what made Margaret walk. Furthermore, there were several instances where individual students would take time out and just sit and observe a fellow student interview Margaret.

Reflection in the classroom

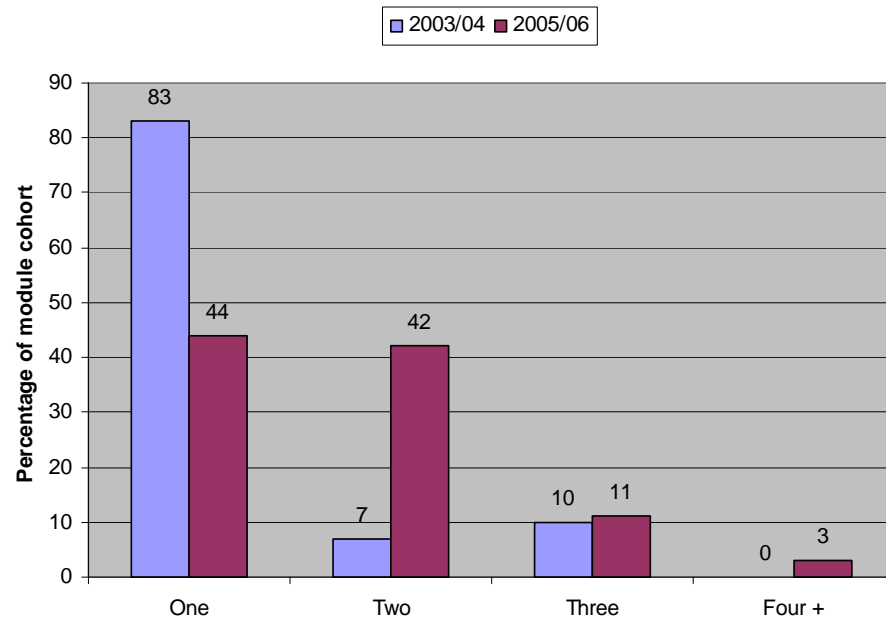
The reflective activity was also observed during the introductory session. In some cases a reflection was initiated through a review (by 'virtual coach' within RecordingCoach) of the student's performance. In one such instance, pondering why they had not obtained an interview recording of Margaret the student voiced aloud and with some dismay: "I didn't turn the mic on!" In other examples, reflection was seen to take place when the student listened back to their interview recording which invariably elicited some form of verbal response or exchange between two or more students. 87% of students confirmed they did obtain an interview recording with Margaret, of which 78% listened to this recording. At several times across all five sessions students were also observed listening to each other's recordings.

What perceptual and behavioural changes occur?

Sound kit bookings and real interviews

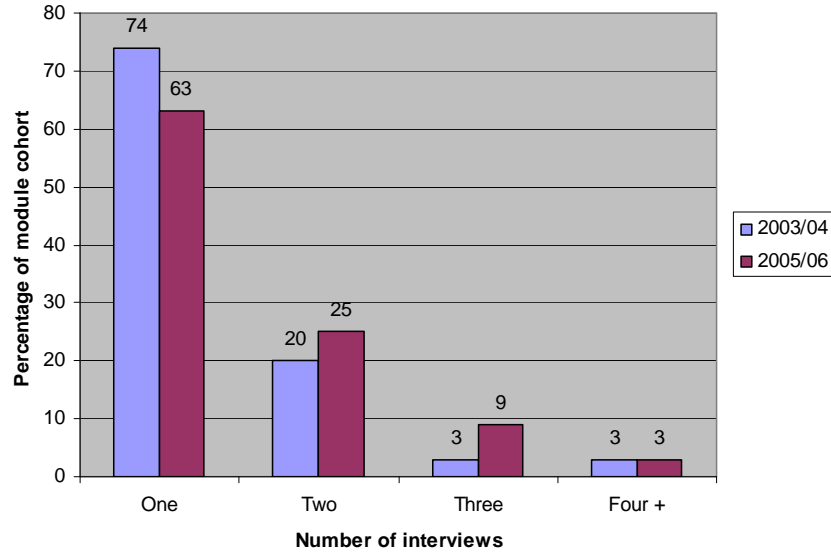
Whilst there was no significant difference in the students' perception of 'opportunities to practice using the sound kit' (see 'The class-based activities as a preparation for the assignment and sound kit availability' p.159 earlier in this chapter) the actual pattern of sound kit usage was significantly different between the two cohorts.

Figure 40 The number of sound kit bookings by percentage of cohort.



During the field trial 56% of students booked out a sound kit two or more times as opposed to 17% of students in 2003/04 cohort. A further comparison of the two cohorts shows an 11% increase by the 2005/06 cohort in the number of repeated 'real' interviews students carried out as part of their work towards the first assignment (see Figure 41 below). Observations and discussions with students as part of the DM1006 assessment process helped to reveal the reason for the number of additional interviews undertaken by both cohorts. A significant proportion of the 2003/04 cohort repeated interviews because they failed to get a recording of their first interview (see also 'Sound kit fault reporting' later in this chapter). By contrast, within the 2005/06 cohort the additional interviews carried out were generally related to the students' desire to improve on their first recording.

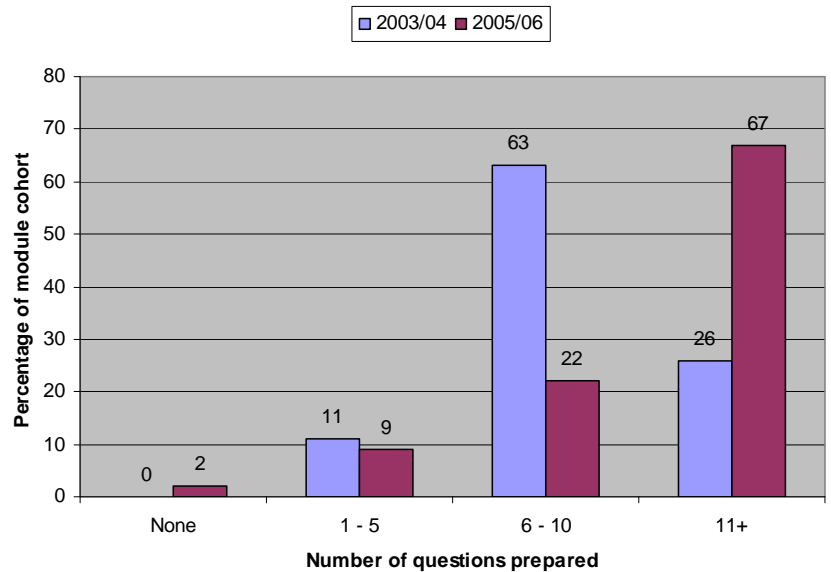
Figure 41 The number of 'real' interviews carried out by students.



Preparation

The most noteworthy difference identified by comparing the 2003/04 and 2005/06 cohorts related to interview question preparation (see Figure 42 below).

Figure 42 Number of questions prepared for the interview.



The comparison indicated a marked increase in the number of questions the students prepared for the interview. 67% of the trial students prepared more than 11 questions (11+) compared to 26% in 2003/04.

Through observing the students use of RecordingCoach it was evident that the first time students undertook the question selection activity, quite a long time (on average 20 minutes) was spent considering, selecting and ordering questions for the virtual interview. This was unexpected as students gave very little regard to

the question selection and organisation activity undertaken in preparation for the role-play. The value of the question selection and ordering activity in RecordingCoach was touched on by a couple of members of the discussion groups.

It's very interesting, I hadn't thought of the question of the 'wish' and it was like 'this can't be a question', so for that yes it helps. (Student 'A' discussion group 4, - 12/05/2006)

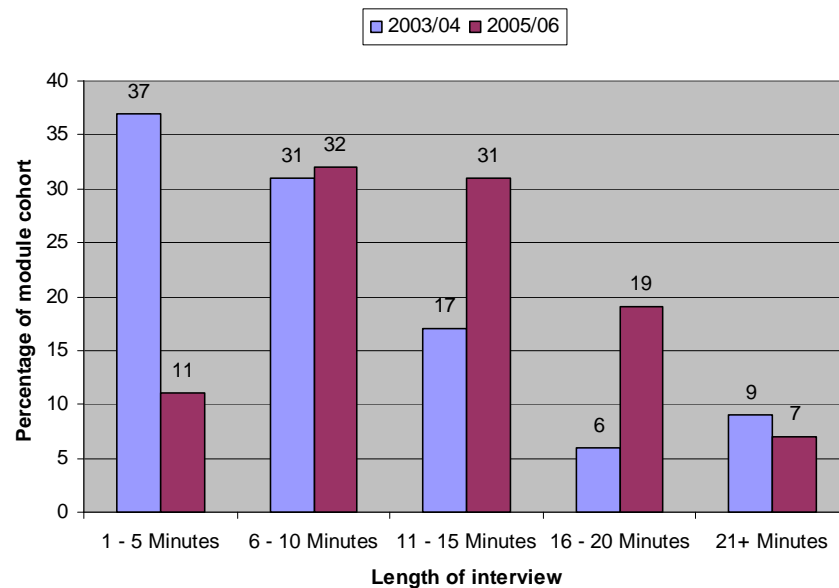
Answering the question 'Does RecordingCoach help you have a better understanding of recording issues?' a discussion group member replied:

A littler bit I think, like asking the questions... (Student 'C' discussion group 2, - 17/11/2005)

Practice

As one might expect, there appears to be a correlation between the number of prepared questions and the length of interview (see Figure 43 below).

Figure 43 Length of original interview recording.



37% of students in 2003/04 only managed to secure an interview between one and five minutes in length. Students were advised that the optimum length of the interview was twenty minutes in support of a final edited composition of two minutes.

In my experience, the longer an interview, the more likely it is that a student will have an opportunity to experience, draw upon and apply a wide range of SRIT skills. The length of an interview is a rudimentary indicator as to the depth and breadth of SRIT experience.

There were also two significant changes to behaviour regarding monitoring recordings and the use of the sound kit.

Monitoring

During recording, monitoring (listening through headphones) is essential in establishing good situation awareness. (See also chapter 3 'Learning issues and verifying observations and assumptions' p.85. See appendix 2b to listen to examples of non-monitored recordings.) Prior to the introduction of RecordingCoach, a large number of students neglected to monitor while recording. This failure to monitor was evident in the assignment work submitted and further confirmed through assessment feedback discussions with students (see also the examples included in appendix 2b). With the introduction of RecordingCoach this substantially changed. An increase in monitoring practice was evident in the characteristics of the work submitted for assessment, through assignment feedback discussions and also within discussion groups. Across the four discussion groups, when asked: "Did you monitor your recording?" everyone responded "Yes".

Yes one ear on one ear off. Because on RecordingCoach you could hear the siren and you could hear the seagulls and all that kind of crap, when I was interviewing, when they was talking I was listening to them as well but then you'd drift off and listen for any other sounds and I was paying attention to all the cars that were driving past. It makes you look at things you would not normally look at. (Student 'A' discussion group 2, - 17/11/2006)

I'd find it hard not to though [monitor recording] because I'd keep thinking it's not recording or something. I'd just be paranoid. (Student 'C' discussion group 2, - 17/11/2006)

Sound kit fault reporting

The second significant behavioural change was associated with the use of the sound kit. As already indicated (see discussion group comments under 'Helpfulness' p.154 of this chapter) RecordingCoach had a positive impact in supporting the use of the sound kit. This finding was further supported by observations made by the departmental technical staff that maintained and issued the sound kits.

The technical staff noted that there was a sharp downturn in requests from students regarding instruction on the use of the recording kits. In the previous years a large proportion of students initially experienced problems with the kits, often with no understanding of basic operation and settings. Brookes (2006, p.1)

Another technician gave an unsolicited account of observations he had made during the first semester of the trial, stating, "We haven't had anyone reporting

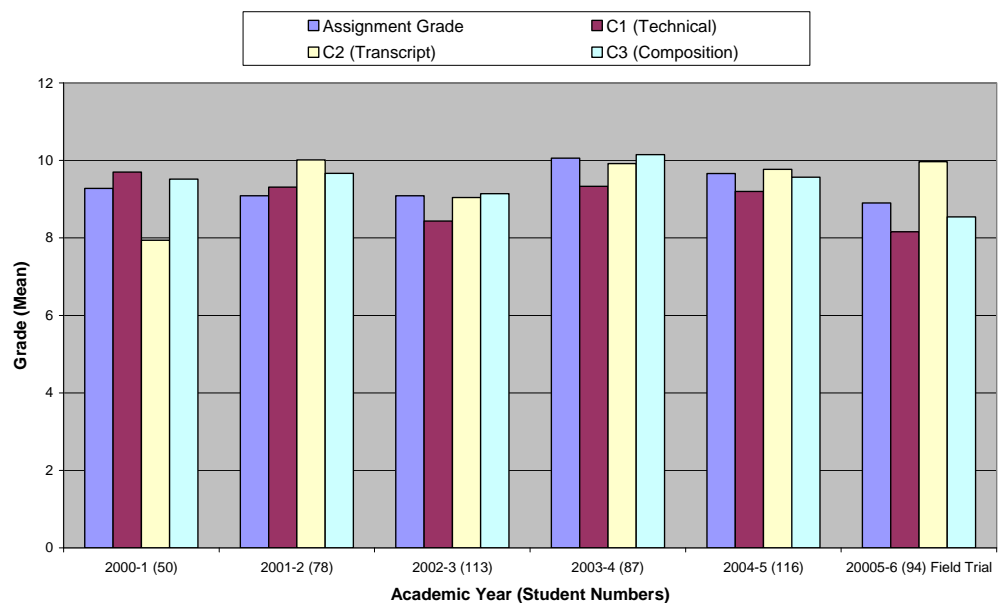
equipment faults so far this year.” Historically, the majority of sound kit fault reporting by students can be linked to ‘user error’ which invariably related to either a failure to put batteries in the microphone or minidisk recorder or a failure to switch the microphone on. In most instances, because the student did not monitor recording, the errors were only discovered after an interview and therefore required the student to undertake a further interview. Such errors clearly contribute to the 2003/04 figures in the comparison of multiple interviews conducted by students. (See Figure 41 ‘The number of ‘real’ interviews carried out by students’.)

How is assignment performance affected?

Attainment

Having taken Kirkpatrick and Kirkpatrick's (2006) advice the question: “Did students attain better assignment grades having used RecordingCoach?” has been left until the latter part of the evaluation. The simple answer to the question is no. A comparison between the field trial cohort and performance of students in the previous five years indicated that students did not attain higher grades having used RecordingCoach (see Figure 44 below). However what the comparison does also indicate is that while the grades did not increase they also did not substantially decrease either.

Figure 44 Student performance element 1 (assignment) and assessment criteria grades from 2000 to 2005 - 06.



Compared with student attainment in the previous five years, the overall assignment grade, as well as the individual elemental criteria grades remained

consistent within the 'C' band (see the bottom of appendix 1b for an outline of the grade scale).

Enhancing performance

The role RecordingCoach played or did not play in the performance of students was discussed with each of the discussion groups. Each was asked to agree or disagree with three statements:

1. Using RecordingCoach prepares students to undertake the assignment.
2. Using RecordingCoach helps students to have a better understanding of recording issues.
3. Using RecordingCoach helps students to achieve a better grade in the first assignment.

Prepares students to undertake the assignment

All four groups unanimously agreed that RecordingCoach did prepare them for the assignment. There was one proviso:

But only if the student takes it seriously. (Student 'B' discussion group 1, - 17/11/2005)

Helps students to have a better understanding of recording issues

The general consensus again was that RecordingCoach aided the understanding of recording issues. Several of the responses have been included elsewhere in this chapter (to illustrate the raised awareness of monitoring issues); other responses included:

It sort of like makes you aware of the problems that can come up before you go out and book out the equipment and make the same cock-ups yourself. (Student 'B' discussion group 1, - 17/11/2005)

Yeah it was really helpful. (Student 'C' discussion group 1, - 17/11/2005)

Helps students achieve better grades

Of the three statements, 'helping students get better grades' initiated quite a lot of discussion amongst members of each group. Across the four groups the initial response was mixed. There was no consensus within the groups. One or two students firmly stating they disagreed with the statement while others when pressed: 'Do you agree or disagree?' tentatively responded 'No' or 'I don't think so'. Pursuing this further, I asked the question: 'Given you have all agreed that it has helped prepare you for the assignment, did the help you got enable you to get better grades?' After further discussion a number of opinions emerged.

If we hadn't used it I don't think I would have walked out with a recording. It does bring to light what could go wrong with the kit, I'd go out for a recording and end up with microphone noise or it distorted because the microphone was too close or too far away and its just....I know whereabouts I can put it to get a decent sort of sound. And....what's this noise on the recording, where the heck is that coming from?' Oh it's the hole in the window. [Laughter from the group] (Student 'B' discussion group 1, - 17/11/2005)

In the first assignment definitely I reckon. (Student 'C' discussion group 2, - 17/11/2005)

RecordingCoach answers the basic questions. (Student 'A' discussion group 2, - 17/11/2005)

Yeah because not everybody has done recording, they have done very different courses. (Student 'E' discussion group 2, - 17/11/2005)

It's a starting point and gives you a little understanding of what you do what you have to do, how to hold the microphone. (Student 'C' discussion group 3, - 17/11/2005)

It is an incentive. It makes everybody a bit more relaxed with everything. (Student 'A' discussion group 3, - 09/05/2005)

If you would have just given me the equipment and booted me out the door, I probably would not have been able to do it [the assignment] but the practice aspect idea of this is how I have to approach it. (Student 'E' discussion group 3, - 09/05/2005)

An interesting side note, after this last statement by student E discussion group 3, I asked the student: 'Did you feel like you were practising?' to which the student replied 'Yes'.

One member of group 3 maintained their initial point of view that their grade was not affected by the use of RecordingCoach. In support of their view the student points out the limitations of RecordingCoach.

It helps start the whole process but it is not going to give you the result at the end because the editing and the transcript, those are not in the software. (Student 'B' discussion group 3, - 09/05/2005)

The original statement 'RecordingCoach helps students get better grades' proved to be a difficult one for many of the students to respond to. The main purpose of pursuing the question with the group was not to obtain a definitive answer but to generate further reflection of their experience. Some students felt they were clearly influenced by RecordingCoach, so much so that they agreed with the statement. Others acknowledged its helpfulness but found it difficult to equate this with better grades.

It probably does not effect the grade in terms of a C or A. In terms of getting people started and interested, actually putting it in different contexts and showing them stuff, it probably does help the grade yeah, but not in the way where you could say, he used RecordingCoach he got an A. (Student 'D' discussion group 3, - 09/05/2005)

In group 4 one student agreed with the statement while the rest of the group maintained that it had not helped them get better grades. This was summed up by a single statement from a student in this group.

It would have taken me longer without RecordingCoach. (Student 'B' discussion group 4, - 12/05/2005)

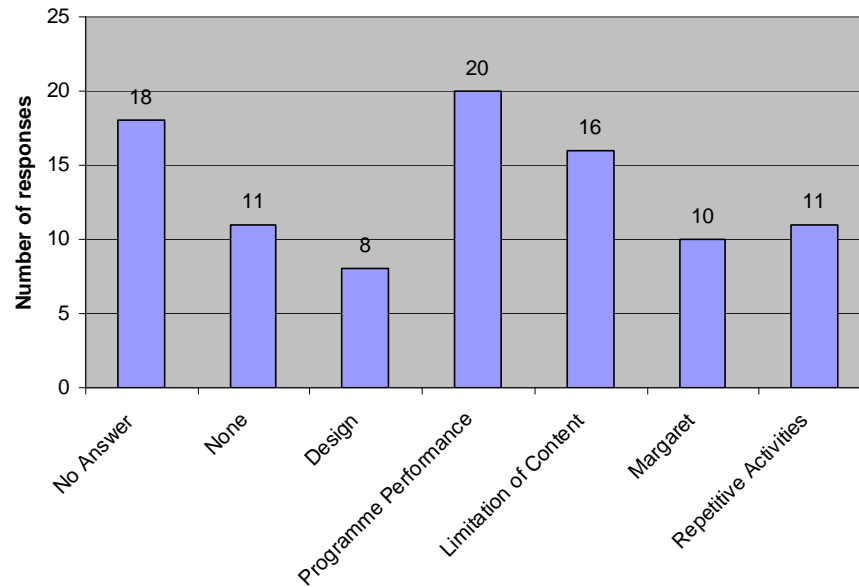
What factors in the design of RecordingCoach impeded or extended SRIT?

To determine if RecordingCoach had aided the acquisition of SRIT skills, the evaluation thus far has focused primarily on its impact on learning and teaching, what Feinstein and Cannon (2002) termed 'educational validity'. As previously stated (see 'Simulation evaluation issues' page 96) the second aspect of this evaluation (which supports the secondary aim of this research project) reflects on the 'verification' and 'representational validity' (Feinstein and Cannon 2002) of RecordingCoach.

A part of the field trial evaluation survey asked students to give their opinion on what they thought were both the worst and best aspects of RecordingCoach. During data analysis these responses were grouped (coded) into seven categories for the 'worst' aspects (see Figure 45 below) and eight categories for the 'best' aspects (see Figure 46).

Worst aspects of RecordingCoach

Figure 45 The worst aspects of RecordingCoach.



Programme performance

Programme performance issues were identified as the sound level (as discussed earlier, see 'Field trial RecordingCoach introductory session observations' page 105) and the time the programme took to load. The load time issue is a consequence of the activation validation which takes place at the start of RecordingCoach. This was included in the design so that access to RecordingCoach could be centrally managed within the learning space throughout the academic year. This could be removed in future to facilitate a faster loading time.

Limitation of content

Limitations of content were highlighted in the survey and also echoed in the discussion groups (see value and relevance elsewhere in this chapter). Both indicated the desire to have additional alternative interview locations and more interviewees. Several students also said they would have liked to have been able to ask their own questions. The difficulty with the scale of RecordingCoach and the compromises made during its development are discussed in chapter 5 (see 'Compromises' p.140).

Repetition of activity

'Repetition of activity' was cited by 11 students and also raised in one of the discussion groups. The two areas raised were sound kit set-up and question selection, and included for example, the need to write the questions down. When the issue was raised in the discussion group, it was clear that the comment was

related to a desire to be able to go back and undertake a new interview more quickly. This frustration with repetition does however indicate the repeated use of RecordingCoach by these students (see also 'Usage' p.158 and Figure 39 p.158 earlier in this chapter). Repetition (practice) was a key concept for RecordingCoach. The fact that some students perceived repetition as a bad thing was not entirely unexpected. It may be helpful for future research to establish how much repetition would be tolerated by students when using RecordingCoach (see chapter 8 for suggestion on future research).

Margaret – is the worst

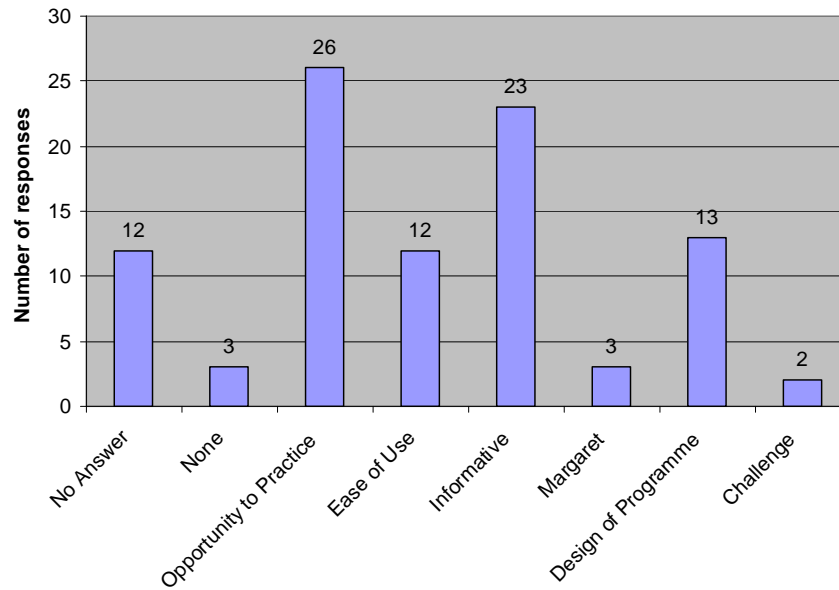
Margaret was considered rude and even obnoxious by a number of students. There were however, no complaints and none were offended by the characterisation or the subject matter covered in RecordingCoach. Students clearly found Margaret provocative, this was supported by observations during the introductory sessions, and as such I would suggest did stimulate students' interaction with the simulated interview aspect of RecordingCoach (see also 'Margaret - is the best' on the next page).

Design

Comments based on the design of RecordingCoach were generally focused on three aspects. The first, related to how user friendly the interface design was. This was also covered with a direct question earlier in the survey (see 'Ease of use' p.153). The second aspect related to the use of the computerised voice to ask the interview questions. One user said they found the voice difficult to understand (although did not rate RecordingCoach as difficult to use), while the remainder of the comments were based on a dislike of the voice for aesthetic reasons. The use of the computerised voice was a concern addressed during its design. I would suggest an alternative, clearer version of a computerised voice be possibly used. The third aspect was associated with how difficult it was to discover Margaret's secret. This final point does indicate that students did respond to the challenge (see also chapter 5 – 'Margaret's secret, the Easter eggs and goals' p.129).

Best aspects of RecordingCoach

Figure 46 The best aspects of RecordingCoach.



Opportunity to practice

The highest number of 'best aspect' responses related to opportunities to practice. This is encouraging and demonstrates that these students did perceive a real world application of the experience they had with RecordingCoach and suggests that the experience was sufficiently authentic to be effective in aiding the development of skills.

Informative

23 students said that RecordingCoach was informative. 'Informative' as used here implies 'within the context of study'. Most of the responses grouped under 'informative' gave descriptions such as: "showed me how to set up a sound kit". This is a very positive response and further supports the relevance of RecordingCoach to support the acquisition of SRIT.

Design (technical appreciation)

Most of the responses which related to the design of RecordingCoach tended to be an acknowledgement of the complexity of the artefact and, in my view, indicated that the students reflected on the design of RecordingCoach from the standpoint of a digital media designer rather than students of sound.

Margaret – is the best

The responses regarding Margaret were interesting. For example one student responded: "The best thing about RecordingCoach was trying to stop Margaret

from walking out.” This suggested that the construct of RecordingCoach enabled the student to develop their own personal micro goal beyond the macro goal of securing an interview and finding the secret. This type of user-based behaviour is a characteristic of game play. Another student stated: “The best thing was annoying Margaret.” In all instances the appreciation conveyed was not with what RecordingCoach did for them in the context of learning, skills acquisition or knowledge, but what they could do while using RecordingCoach.

Challenge

Two students cited ‘Challenge’ as the best aspect of RecordingCoach which suggests that the students were motivated by goal-based tasks.

Reflecting on the evaluation data

RecordingCoach was clearly well received by the students. The programme was stable, easy to use and enjoyable (see below). While the majority of the artefact’s use took place in the class, students perceived it to be a valuable informative resource, one that could also aid not only their own future study but also the study of the sound module by future students. Students demonstrated a transfer of the domain-specific experience and knowledge (SRIT) they had gained through RecordingCoach to the real world. “...the whole purpose of learning is the ability to use what is learned outside of the classroom” (Duffy and Kirkley 2002, p.136). Headphone monitoring was prevalent for the first time across the cohort; sound kit familiarisation issues and the number of failed recordings diminished significantly.

Observations made during the introductory session suggested that the class-based activities had been enhanced and encompassed new opportunities for collaboration during the initial introduction of the sound kit. I observed a great deal of positive interaction between students and interaction with RecordingCoach as well as quite a lot of additional laughter across the sessions. RecordingCoach facilitated the nurturing of what Brown *et al.* (1989) termed “the social matrix of authentic activity” during a hands-on introduction to SRIT.

Experiential opportunities to develop an initial feel for SA occurred in a non-critical way (before the real interview). Reflection, both pre-existing student-initiated and new tutor-supported (within the context of sound kit familiarisation and interview situation through the virtual coach) were present. Although assignment grade attainment was not affected, having reflected on the evaluation, I feel that the evaluation shows that use of RecordingCoach has been positive to the

learning experience. In addition to the changes in the students performance/behaviour mentioned above it was also clearly evident from comments made by discussion group members, who frequently recited information contained within RecordingCoach in a mantra-like manner. For example, “one ear on, one ear off” when discussing headphone monitoring. Another example demonstrated how a student overcame problems setting up the sound kit, “When you go out...you think shit why is that not working? I was thinking back [to RecordingCoach] and plugging all the plugs in” (Student ‘B’ discussion group 2, - 17/11/2005).

A positive contributing factor to the success of RecordingCoach I believe was the high degree of authentic interactivity it contained. Some students clearly associated the use of RecordingCoach with practice. The recall of SRIT information and procedures by students was underpinned through the experiential learning opportunities (rehearsal) that RecordingCoach provided.

“...there is no ‘factor x’ that makes e-learning effective. Instead, e-learning solutions work well when they satisfy a pedagogical need within a complex socio-cultural context, either solving a problem or amplifying a learning opportunity” (Ravenscroft and Cook 2007, p.216). I believe that RecordingCoach achieved both, and the findings of this evaluation are, in my view, very positive.

Summary notes

As a footnote to the evaluation, it is worth acknowledging that the comparison of the cohorts of DM1006 across different years is only indicative and has been used as a rudimentary tool to establish if there were any significant differences to learning and teaching through the introduction of RecordingCoach. For a robust comparison of learning and teaching between the years regard would need to be given to prior knowledge and experience of students, the contribution by different teachers and the teaching styles they adopt, the availability of resources plus a range of other factors which contribute to the overall experience and delivery (see also chapter 8 – ‘Suggestions for future research’ p.181).

Chapter 8 - Project reflection, original contribution and further research

In this concluding chapter I reflect on the research approach and project goals and discuss some of the lessons learned. I consider the original contributions this project has made and suggest possible future research that could be developed out of this project.

Reflecting on the project – some lessons learned

A practice-based approach

The initial review of literature undertaken at the start of this project brought about a realisation that while there is the dual perspective of teacher and researcher, which is part of the action research approach (see chapter 6 - 'Research approach' p.143), there also exists, as part of this practice-based project, a third perspective, that of the designer (see chapter 2 - 'A trilogy of perspectives and roles' p.67). These three perspectives exist because of the action research (researcher and teacher) and practice-based (interaction designer) aspects of this research. Such a three-pronged approach has been advantageous in a number of ways.

The action research approach has been beneficial in addressing the disconnect between research and actual teaching practice, while the practice-based aspect has bridged the gap that exists between the design and the realisation of a TSL artefact (see chapter 2 - 'The design and realisation of TSL - a multi- and inter-disciplinary endeavour' p.51).

This research project is a case study of TSL in an underdeveloped subject area within English higher education provision (see chapter 1 - 'The underdevelopment of TSL in art and design' p.15), and as such both the action research approach and practice-based aspect of this research are significant in that they provide a holistic, empirically-supported account of the design, realisation, implementation and evaluation of learning technology to support studio-based practice in the art and design practicum.

Furthermore, the three-pronged approach has afforded the opportunity to reflect on how each of the perspectives can be, and are, unified under a single banner, in so much as each is a finer granular aspect of an aggregated concern for UXD.

RecordingCoach – design

Design framework

With an absence of a unified theory for learning technology and the multiple voices and associated perspectives within this field of study, Garrett's (2003) 'elements of user experience' I feel, has been a valuable model for the creation of a 'road map' for the design of TSL. Garrett' (2003) model accommodated the full range of (appropriate for the subject matter) contributing theories models and principles, and allows these finer granular concerns for UXD to be brought together in an interconnected and cohesive manner.

Design for repeated use (practice)

At the start of the development of RecordingCoach, while I saw the opportunity to facilitate practice through the use of TSL (i.e. use RecordingCoach prior to undertaking the real assignment), I actually did not make explicit my expectation that practice also meant repeated use of RecordingCoach. Repeated use did not appear as either a stated aim or objective of the artefact design (for a list of both the aims and objectives of the artefact see chapter 4 pp. 110 - 111).

At an early stage in the design I assumed wrongly that the primary goal presented to the student, namely 'securing an audio recording of an interview with Margaret' was sufficiently interesting to engage a student in the repeated use of RecordingCoach. While this assumption did in part hold true (particularly for students who did not secure a successful interview) it did not take sufficient account of the possible opportunity for students to develop expertise by what Gage and Berliner (1998) referred to as "over learning" (see chapter 2 - 'Situation awareness and SRIT - 'dynamic skills p.62). Once a student secured an interview (achieved the goal) the only thing which encouraged further use (over learning) would have been residual interest in the artefact, given that the perceived value of practice (as it relates to over learning) was underdeveloped across the cohort (see chapter 3 - 'A profile of DM1006 student cohort' p.77).

The lack of consideration of this point was brought to the fore during some early usability testing where it became evident that including a secondary goal - 'to discover Margaret's secret', could encourage longer-term engagement with RecordingCoach. The inclusion of this secondary goal was sufficiently 'perturbing' for the student to promote, as Jonassen (1998) suggests, 'learner buy-in' which in turn led to repeated use or what could also be described as practice. It was this secondary goal that proved to be key to promoting 'over learning'.

The evaluation (chapter 7) proved insightful when considering further how a sustained and/or repeated use of RecordingCoach could be additionally enhanced. The evaluation highlighted the absence of alternative equipment, locations and interviewees, which did appear to contribute to its limited use outside class. In hindsight it may have been beneficial to make the three included discussion streams within the 'take an assignment' section distinctly different. By doing so it could have promoted the perception of a more diverse experience and thus encourage practice over a longer period of time (outside the session and possibly across several weeks). In the design of the discussion streams for example, Margaret could have been dressed differently for each interview, promoting the idea that successive interviews are actually new instances of the interview. In one or more of the three discussion streams Margaret's answers could have been distinctly different or extreme in their viewpoint providing a greater degree of contrast between the three interview situations. Such considerations at the point of design would not have substantially increased the production time, beyond the initial script writing and live action video shooting.

Design for reuse

As outlined in the literature review (chapter 2) interest in learning objects has not always been driven by pedagogic concerns but have, in part, been driven by a pragmatic need to both support teachers realise TSL and to achieve economies of scale which are afforded by a learning object's potential for reusability. After all the design and realisation of TSL is both labour intensive and expensive to implement. A prime example is the £300,000 the Seeing Drawing project (see element 2 of the supporting creative work) cost and its absence across the UK art and design subject area today. While economies of scale help make the creation of large scale TSL artefacts viable, interest in reusability needs to be tempered by a concern for pedagogy. Ravenscroft and Cook (2007, p213) argued that concern should be given first to the use of a TSL artefact before consideration be give over to its possible reuse, emphasising "the importance of thoroughly analysing the influence, impact and value of innovative e-learning activities before assuming they are ripe for wider exploration".

RecordingCoach was designed for a specific need, an approach which is in keeping with the views of both Laurillard (2002) and Ravenscroft and Cook (2007) (see chapter 2 - 'The starting point - a grounded approach' p.53 and chapter 7 - 'Reflecting on the evaluation data' p.172). Reflection on the design process and subsequent use of RecordingCoach has thrown up one significant error of judgement made during the design phase. No regard was given to the

updateability of RecordingCoach. Unlike many learning objects, which are small and tend to be based around a single stand-alone learning objective, used for around two or three minutes in length, RecordingCoach is more like what Aldrich (2005) described as – ‘elements within a course’.

RecordingCoach is a large artefact, the average length of use by each student was 70 minutes and its construct supports multiple learning objectives (see chapter 4, pp.110-111). RecordingCoach is made up of 1031 separate files brought together under a single framework. Dividing this framework into inter-connected modules could have made it easier to update, amend or even conceivably customise. For example, since the field trials (2005-6) infrastructural changes to the University of Wolverhampton's information technology provision has forced modifications to how RecordingCoach accesses and stores the audio recordings as part of the ‘Takes an Assignment’ section of the artefact. This has forced a re-engineering of aspects of the artefact. A further example, one that is far more problematic with regard to artefact updating, is the redundancy of the Minidisk system. These recording devices are being replaced by solid-state recording systems. Given the amount of investment in the design and realisation of a TSL artefact like RecordingCoach, I would strongly recommend that some consideration be given to how the construct of a large artefact, such as RecordingCoach, can be put together in a way which more easily facilitates changes. In other words, thought needs to be given to how the artefact can be reasonably future-proofed.

It may be of interest to note that while RecordingCoach was not designed specifically for re-use, it has been, and continues to be, successfully re-used in a substantially different learning and teaching context. In this alternative context, RecordingCoach is being employed to help teach (as part of studio-based practice to level one undergraduates) interaction design and specifically, the acquisition of design skills via the use of three interaction design tools – the functionality specification (see element 3 p.297 of the supporting creative works), interactivity flow charts (see elements 4a and 4b pp.309 - 310 of the supporting creative works) and scamps (static visualisations of interface designs). Each tool is explored through interaction with RecordingCoach.

Furthermore, it is worth mentioning that two years on from the field trial evaluation, RecordingCoach continues to be used (by myself and colleagues) to support the introduction of sound recording skills. As of January 2008, over 350 students have thus far used RecordingCoach to support their acquisition and

development of SRIT skills. In its present construct, the artefact's viability (shelf life) however remains a short one (see above).

The project goals

This project set out to ascertain if TSL can aid the acquisition and development of practical skills associated with sound recording a location-based interview, introduced (as part of studio-based practice) during a three-hour class to level 1 undergraduate art and design students. To this end, and because of the absence of any existing comparable TSL artefact (off-the-shelf solution), RecordingCoach needed to be designed and realised. Its construct has been based on sound pedagogic and design principles, and underpinned by theories and models drawn from a wide range of disciplines and specialisms. RecordingCoach was used on five separate occasions with level one undergraduate art and design students over the course of a year in the delivery of a sound-based module of study. Data was collected during this time and an analysis of this data has been very positive indicating that learning technology can be employed to support the acquisition of SRIT skills in the studio-based practicum of the art and design subject.

The two secondary complementary questions (see chapter 1 'Research question, approach, arguments and project framing', p.20), have also been addressed. The first of these: 'What is the framework for this research project?' has been addressed through the review of literature in chapter 2. The second complementary question that asked: 'What factors relating to the design of the TSL artefact either enhanced or impeded skill acquisition?' has been explored in chapter 7 as part of the field trial evaluation and data analysis and is a point for discussion for future research (see 'Suggestions for future research' later in this concluding chapter). The argument also outlined in the introduction (chapter 1) has been set out and supported across the reviewed literature and, I feel importantly, it has been further re-enforced in practice through the design, realisation and successful deployment of a TSL artefact.

Considering this project's aforementioned main and two secondary research questions, on reflection, I feel that this project has addressed each of these. Of course more work can be undertaken, for example, to expand our understanding of the factors that relate to the design of RecordingCoach which either enhanced or impeded skill acquisition. This and other suggestions for future research are discussed later in this chapter (see 'Suggestions for future research', p.181).

Original contribution

The trilogy of perspectives (three-pronged approach) this project took has resulted in several original contributions. The first and most significant of these is centred on the rationale for this research project (see chapter 1).

Addressing the underdevelopment of TSL in art and design

As outlined in chapter one (see 'The underdevelopment of TSL in art and design' p.15), our understanding of the use of TSL in the undergraduate art and design subject area is underdeveloped. While some literature exists pertaining to the use of VLEs and learning objects in art and design, these studies focus on art and design subject matter that is based around either advancing contextual/theoretical understanding or addressing the development of knowledge that resides on the periphery of studio-based practice, for example, the 'Photo Essay' learning object as mentioned in chapter 1, p17.

In attempting to reflect on art and design students' views, needs and attitudes towards e-learning Logan *et al.* (2007) reported:

It had been hoped to include research literature reflecting the views of learners in this section but it proved difficult to access empirically based research on this issue; only one article was found and it was based in a cultural context that appeared to be so far removed from the British one that it shed little light... (Logan *et al.* 2007, p.9)

At the time of writing-up this thesis I have not been able to locate any studies that have focused specifically on the use of TSL to support undergraduate art and design studio-based practice. As such, this research significantly and originally contributes to the knowledge and understanding both specifically within the art and design TSL research community and the wider TSL research community by providing one of the first, if not the first, empirically-based case studies of the design, realisation, implementation and evaluation of TSL employed as a means of supporting studio-based practice in the undergraduate art and design subject area.

TSL to support SRIT skills

Both the literature review (see chapter 2 pp. 23-69) and needs and task analysis, which included the UK providers survey (see chapter 3 pp. 70-103) carried out as part of this research was unable to identify any TSL artefact which supports a 'learning by doing' approach to the acquisition and or development of SRIT skills. As such considering this research at the finer granular level within the art and design subject area, namely the discipline of sound recording, this study is the first

of its kind to explore the use of TSL in support of a practice-based approach to the acquisition of SRIT skills. This project, which includes the artefact RecordingCoach, is an original contribution to this discipline. (For a further contribution to this discipline, see also 'Linking SA to SRIT' later in this chapter.)

UXD as a holistic concern

While this research significantly contributes to the art and design TSL research community, I would suggest that it also contributes to what Conole and Oliver (2007a p.3) termed the “spectrum of activity” in the wider (general) TSL research community. This further contribution comes out of this project’s argument for a comprehensive consideration and/or understanding of UXD as part of the holistic approach to the design and evaluation of TSL. (See chapter 2 - Literature review and specifically pp. 39-51 starting from 'Borrowing theories - part 2 (user experience design (UXD))' to, and including, 'More than pedagogy - concern for UXD in games and other domains'.) The case for this argument has been built on the work of Boyle (2002) and Garrett (2003) and informed by, for example, the observations of Aldrich (2005) and Conole and Oliver (2007b) that new technologies such as computer games have something to offer TSL. A comprehensive (holistic) consideration of UXD requires us to step back from finer granular concerns of, for example, ‘interaction design’. Such an approach, as I have argued, affords us the opportunity to take in the bigger picture e.g. draw more freely upon a spectrum of domains and their associated practices as well as help unify, to some degree, what Conole *et al.* (2003 in Conole 2004, p.2) termed the “multiple voices” within the TSL research community.

The notion of ‘stepping back’ is a theme echoed by other researchers in the wider TSL community. For example, the literature review highlighted the shift from a finer granular concern for individual learning theories to a more general consideration of how learning theories can be combined or “blended” (Mayes and de Freitas 2004, p.10) for TSL. The review also outlined ‘learning design’ which Beetham (2007, p.26) referred to as a “dominant emergent paradigm”. This paradigm shifts attention away from content to the wider perspective of the learning activity. Both in effect demonstrate a need to step back from finer granular concerns.

Furthermore the review has also highlighted how TSL is a “multifaceted and complex area” (Conole and Oliver 2007b, p.3). For example, Ravenscroft (2003a) argued that researchers, administrators and practitioners (teachers) need to work

collaboratively in developing a discourse for TSL. This project's aforementioned argument has demonstrated, through both a literary argument and, I feel, more importantly, through successful practice, that concern for UXD unifies the teacher, research and designer under a single banner, while allowing each, their own priorities and finer granular concerns. These concerns are after all inter-related as Garrett (2003) pointed out. (See chapter 2 – 'The starting point - a grounded approach' p.53 and 'A UXD TSL model' p.42.)

A comprehensive consideration of UXD represents a new perspective of the approach to the design and evaluation of TSL, which I assert, is useful to the wider TSL research community and as such is an aspect of this project's original contribution.

Linking SA to SRIT

The final contribution relates to the discipline of sound recording within the art and design subject area. While the relationship between SA and SRIT have not been the primary focus of this research, I have pointed out elsewhere in this thesis that SA is helpful in defining, at a cognitive level, the skills associated with SRIT. Having reviewed the literature concerned with SA and SRIT (see chapter 3 p.96 for a brief review of SRIT key texts), to my knowledge, there has never been a documented link made between the practice of SRIT and SA. Although the link between SA and SRIT is by no means extensively pursued in this thesis, the initial association made here does represent the first tentative step towards the possible establishment of SA as a cognitive foundation for SRIT skills within this professional discipline. As such I would assert that this is significant and a further aspect of the original contribution this multi- and inter-disciplinary practice-based research project has made. (See 'Suggestions for further research' below.)

Suggestions for future research

The diverse research interest across the TSL research community (see chapter 2 – 'TSL - a landscape of research and practice' p.30) has the potential to lead any discussion about future research possibilities down many avenues. Rather than speculate across such a broad spectrum of interests, the primary focus of consideration here draws from the three perspectives adopted by this project, namely researcher, teacher (or rather 'teacher as researcher' - embodied by the action research approach) and interaction designer. From these inter-connected perspectives there are several suggestions worth highlighting which have the potential to build upon and/or extend the research undertaken by this project.

An in-depth study of the relationship between SA and SRIT

In this research project the first step towards proposing a relationship between SA and SRIT has been taken. I suggest that this is an area for further research and development. An obvious place to start would be to further research and review emerging texts on SA and SRIT. It may be beneficial to revisit the provider survey (see chapter 3 and appendix 4) and or conduct a new survey to ascertain if the wider SRIT community of practitioners consider SA to be a useful representation of the cognitive processes underpinning the SRIT activity. Additionally a more detailed task analysis including a breakdown of the various aspects of SRIT (see also chapter 3 'SRIT and practical skills', p.99) coupled with the mapping of these tasks to the three levels of SA (see chapter 2 'Situation awareness and SRIT - 'dynamic skills, p. 62.) may afford us a better understanding of the cognitive processes integral to SRIT skill acquisition. As such, this research has the potential to advance our consideration of how we can better support the acquisition of SRIT and other SA-derived practical skills. It may also be beneficial to consider whether SA exists elsewhere in the art and design subject area. One such example could be film and/or photographic 'reportage' that, at first glance, would appear to share a number of the characteristics of the sound recording of a location-based interview. (See also chapter 3 'SA and a goal-directed task analysis' p.90; chapter 4, 'Situation awareness, simulators - facilitating practice' p. 105 and chapter 6 'Measuring situation awareness' p.145.)

Mapping UXD as a concern across TSL research and practice

Having argued for a comprehensive consideration and/or understanding of UXD as part of the holistic approach to the design and evaluation of TSL, it would be beneficial to map UXD to existing research interests in TSL. To do so would highlight how UXD is manifested in the various concerns across the field of TSL research. A starting point could be to use Conole's (2004) table of substantive research areas or Conole and Oliver's (2007b) later table. Building upon this further, it could be beneficial to map concern for UXD more generally outside of specific concern for TSL, to encompass creative and design disciplines, services and performances, as a means of seeking to capture a taxonomy of UXD. Such a taxonomy could be beneficial in providing a point of reference where we (as TSL researchers) can gain a better understanding of user experience and where we (as TSL designers) are able to draw more widely upon the practices and achievements of other practitioners (designers of experience).

Garrett's five planes as a team-based developmental model

Although this project has required me to adopt several perspectives, it is important to acknowledge that this project has been undertaken by one person. Having reflected earlier in this chapter that, as a model, 'elements of user experience' (Garrett 2003) is helpful in bringing together the various inter-connected concerns of the multi- and interdisciplinary endeavour that is TSL design, it would be prudent to examine the use of the model within the context of an actual TSL team. Either Garrett's (2003) model could possibly be mapped to any existing documented case studies of the design of TSL or alternatively a team embarking on a new TSL-based project could adopt the model. The latter of these two options would provide the opportunity for a more comprehensive study.

Expanding the field-trial evaluation

It also may be beneficial to undertake a comparative study across a single year group, with some students given access to RecordingCoach and others not. This would provide a better basis for comparing the immediate effect of TSL on student attainment and address the limitations of comparative study in this project as mentioned in the summary notes of chapter 7. This suggestion however would have ethical implications regarding equity and parity of learning opportunity, and so should be undertaken with full ethical approval.

While the evaluation undertaken in the project has focused on short-term gains, a longitudinal study of the impact of RecordingCoach could also prove insightful. We could monitor the progression of the users of RecordingCoach (students) across their remaining study, looking at their application of SRIT skills. This would help to ascertain if the knowledge and skills acquired, with the support of RecordingCoach, are used more widely during the remainder of their study. This could be achieved by looking at equipment usage patterns, and the creative works of students to see if bespoke recordings or catalogue/stock sounds are more or less frequently employed. Such an evaluation would equate to Kirkpatrick and Kirkpatrick's (2006) level three 'behaviour' evaluation which seeks to ascertain the degree to which acquired knowledge and skills are transferred from the training environment into the workplace.

In support of future projects

In light of the significant time and cost of the design and production of this type of learning technology artefact, it might be beneficial to consider the evaluation of

RecordingCoach beyond a concern for pedagogy (an aspect of UXD) and consider the use of RecordingCoach from a pragmatic institutional perspective.

What is the return on investment? A cost benefit analysis of RecordingCoach could be helpful in securing both institutional and financial aid for future large-scale projects. Both short and long term, is there a link between the use of TSL (in this case RecordingCoach) and student retention/progression rates? Additionally it may be helpful to look more closely at the impact that RecordingCoach had/has on the institution's provision of equipment-based resources (sound kits) in terms of maintenance, numbers required and their availability. Is there a better regard for the care of equipment by the students, and is it used more effectively? This would contribute to Kirkpatrick and Kirkpatrick's (2006) level 4 evaluation of 'results' or benefits to the company.

RecordingCoach – Tacit Knowledge

Given that RecordingCoach is the embodiment of the numerous choices made with regard to the artefact's conception and realisation, this next suggestion relates to the opportunities that a deeper scrutiny of the artefact affords.

In support of the approach taken by this project I have argued that the critique of artefacts is helpful in advancing our own understanding of UXD (see chapter 2 'Artefact review - the role of the critique' p.56). I have also suggested that an artefactual critique can help liberate the tacit knowledge embodied in an artefact. I feel that this is particularly relevant in a project, such as this one, where one person has undertaken all the work.

While this thesis has been the vehicle for questioning, reflecting on and documenting the approach and choices I have made, the fact remains that I may be too close to the work to be able to tease out aspects of the tacit knowledge I drew upon in this project. I therefore suggest that it may be advantageous for others to rigorously critique the artefact. Such critiques should in turn be included as an addendum to this case study (research project). I have initiated this process by inviting the participants of the 'providers survey' (see chapter 3) to use and critique RecordingCoach as well as making the RecordingCoach freely available to acquire and evaluate via a web site <http://www.RecordingCoach.net/>. Furthermore, RecordingCoach is being submitted for various peer-evaluated competitions. In 2005/6 RecordingCoach was awarded the Higher Education Academy 2006 e-tools runner-up prize in recognition of the depth and breadth of

reflection RecordingCoach afforded its users. Unfortunately the full evaluation made by the judges has not been published and so can not included here.

It may be of interest to note here that following the usability testing sessions in 2005, one of this project's usability testers (see Figure 27 chapter 5), during a year's industrial work placement as an e-learning developer, went on to produce a learning object based on a microphone simulation for students studying studio sound engineering. I would suggest that this points positively to how the participant's exposure to, and engagement with the RecordingCoach artefact has helped inform TSL possibilities within his own practice.

Final remarks

In chapter 5 - 'distribution and delivery' p.115, I discussed the approach to the artefact design that led to an identification of a set of distribution and delivery requirements. Such an approach purposefully ignored the existence of the established institutional TSL framework (VLE). (See also chapter 2 'toolkits, VLE and learning objects' p.32). The approach I used instead focused on the subject matter (in this instance SRIT), learning outcomes and students and ignored, at least initially, all budgetary, physical and technological restrictions in consideration of the ideal solution, the ideal user experience. As teachers we have to be masters of compromise. Given an infinite budget, resources and time, most of us would not choose to teach our subjects in the way we do. For technology to be able to liberate us from our compromised approach, effectively support learning, and in particular 'learning by doing', it is, in my view, important to at least suspend the desire to ask: 'What can I do with learning technology?' and instead say: 'This is what I want from learning technology'. Without such an approach RecordingCoach would never have been conceived. For example, the VLE presently used by the University of Wolverhampton is incapable of supporting some of the functionality designed within RecordingCoach such as audio recording, synchronising and delivering in real time, eight different audio streams and video. The virtual learning environment should not dictate the virtual learning 'experience'. In short, the environment should support the desired user experience. "The mode of delivery is irrelevant by comparison with the mode of engagement with the content" (Laurillard 2002, p. 107). The Internet is all too often seen as the mode of delivery behind which all other considerations must be aligned.

Appendices

Appendix 1 - Module Assignment Brief and Assessment Criteria

Appendix 1a - Element I and II Assignment Brief

Part 1 of 2

Lecturer: Jim Davis

DM1006 Introduction to Digital Sound
Element I & II - 2002/2003
Weighting - 100%

Element 1 - 50%

Student notes:

Focus:

This element focuses on the application of skills, working methods and quality of the final product.

Element I Project Brief:

What's it like to be a.....?

Construct an audio programme/presentation based on the recording of unscripted and undirected interview.

You must have little or no prior knowledge of your interviewee.

The final Audio programme to be a maximum 2 minutes in duration and a minimum of 1minute.

Please note it is NOT permissible to submit work based on 'What's it like to be a student'.

Structure and content. - The transcript

It will be important for you to transcribe your original material (interview), from which you will be able to experiment with both the structure and content of the piece, bearing in mind the given theme 'What's it like to be a ?'

Effects and audio manipulation must be avoided. The focus is on your ability to capture and edit audio material into a well - structured, cohesive technically competent composition.

Your transcript should clearly identify interviewer and interviewee, have a time/location signature and an indication as to the usability of the segment. You are advised to transcribe your entire interview. This may be impractical in some instances, where interviews are extremely long. For submission purposes your transcript MUST represent at least 2 (two) minutes of the original source interview/recording.

Element I Deadlines:

Deadline: Friday 22nd November 2002 4:00pm - Wolverhampton Science Park Reception.

Element I submission check list

- 1) Edited audio composition (interview)
- 2) Written transcript - **in printed form only** (Paper)
- 3) Completed Assessment Sheet

Please ensure you keep a copy of the submitted work to use in element 2. Work submitted for element 1 will be returned at the END of the semester only.

Page 1 of 2

Part 2 of 2

Lecturer: Jim Davis

Element 2 - 50%

Focus:

This element focuses on Application of Skills and the Quality of the final product.

Element II Project Brief:

'sound environment'

From additional multiple sound recordings, of which no less than 50% must be original, create a "sound environment" to contextualise the interview edited in element 1.

What is meant by original? Original constitutes recordings of sounds generated from an un-recorded source. (This would exclude using a microphone to record audio output from a television, Audio CD, Computer game sound effects such as those found on the Play Station etc). Please refer to the lecturer for specific clarification if you are unsure whether your proposed recordings sit outside the term 'original' in this instance.

You will be required to integrate your edited interview (submitted as part of element 1) and sound environment together and present these as a single .WAV file. You may wish to re-edit your interview, as part of developing your composition.

Sound Log:

Sound environment to be accompanied by a printed log identifying all original source recordings, found/sourced recordings (either used and unused).

Element II Deadlines:

Deadline: Friday 10th January 2003 4:00pm - Wolverhampton Science Park Reception.

Element II submission check list

- 1) Edited audio composition (Sound environment and interview)
- 2) **Printed Sound Log**
- 3) Completed Assessment Sheet

Special Note:

Failure in an individual element is allowed, providing a minimum of D5 is achieved for the component.

Submission:

All Paper-based and digital work on removable media (CDs and/or Zips), including your completed assessment sheet must be **handed into Science Park Reception** and accompanied by an assignment receipt form (copies of which can be found at: <http://www.wlv.ac.uk/subjects/imc/receipt.doc>)

Digital work submitted on the Science Park 'Y' drive must still, in all cases, be accompanied by submission of assessment sheet and paper based material to the Science Park Reception.

Please ensure when handing in your work you receive a receipt, and all your work is clearly labeled with your name, student number and e-mail address.

Appendix 1b - Element I assessment criteria

Lecturer: Jim Davis

Dm1006 Introduction to Digital Sound - 2002/2003

Element 1 of 2

Assessment Sheet

Module Weighting - 50%

*This assessment sheet MUST be completed and submitted along with your assignment.
Do not write in or across any of the grey boxes.*

Student:	Number:
----------	---------

Assignment outline and deadline/s:

<p>Construct an audio programme/presentation based on the recording of unscripted and undirected interview; to be accompanied by a written (printed on paper) transcript of at least 2 minutes of the original un edited recording. Audio programme to be a minimum of 1 minute and a maximum 2 minutes in length.</p> <p>Deadline: Friday 22nd November 2002 4:00pm - Wolverhampton Science Park Reception.</p>

*The criteria listed below are NOT individual elements.
Assess your performance against each of the criteria using the grade scale at the bottom of the page.*

Criteria & weighting	Self Assessment Grade	Lecturer Feedback	
<p>Application of Skills Accuracy and Control. Demonstrate technical/manipulative skills (Recording and editing). (25%)</p>			
<p>Working Methods Written Transcript - Accuracy, organisation and presentation. (25%)</p>			
<p>Quality of Final Product (media) Audio Composition. (50%)</p>			
			Provisional Grade

Grade Scale

A (16,15,14) = Outstanding performance	E (4) = Unsatisfactory / Compensatable Fail
B (13,12,11) = Very good performance	F (3,2,1) = Fail / UnCompensatable Fail
C (10,9,8) = Good performance	F (0) = No assessment
D (7,6,5) = Satisfactory performance	

Appendix 1d - Module guide

Part 1 of 2

University Of Wolverhampton
School of Art & Design
Module Guide

Module Title: Introduction to Digital Sound

Module Code: DM1006

Level: 1

Semester: 1 & 2

Credit Value: 15 **Pre-requisites:** None

Co-requisites: None

Academic Year: 2002/2003

Time Slots:

Tuesday Evening - 6:00 - 9:00pm (Group A)
 Thursday Afternoon - 2:00 - 5:00pm (Group B)

Location: Science Park

Room: Science Park
 Front Lab - PA102

Module Leader:

Jim Davis
 Tel No: (01902) 824076
 Email: Jim.Davis@wlv.ac.uk
 Schools of Art & Design

Availability of module

leader:
 During the timetabled session
 and by appointment.

Other Teaching Staff:

Phil Nichols
 Tel No: (01902) 322935
 Email: in5379@wlv.ac.uk
 Schools of Art & Design

1) OVERALL AIM:

This module introduces students to sound theory, audio recording techniques, digital audio technology and the composition of sound.

2) LEARNING OUTCOMES:

At the end of the module you should be able to:

Subject Specific Outcomes (SSO)

- Utilise digital audio recording and editing equipment to gather, organise and manipulate dialogue.
- Design and construct audio compositions using digital audio applications.

Personal Transferable Skills (PTS)

- (5) Act Independently
- (3) Gather Information

Generic Academic Outcome/Criteria (GAO/C)

- (A) Make(ing) and Design(ing): explore potential of media, materials and processes.

3) WEEKLY INDICATIVE PROGRAMME:

The programme takes the format of lectures, workshops and studio sessions.

4) READING AND OTHER LEARNING SUPPORT MATERIALS:

CLAYTON, J. (1994) *Interviewing for Journalists - How to Research and conduct interviews you can sell*. Great Britain: Piatkus Publishing Ltd.
 BEAMAN, J. (2000) *Interviewing for Radio*. London, New York: Routledge.
 LYVER, D. and SWAINSON, G. (1999) *Basics of Video Sound*. 2nd ed., Oxford: Focal Press
 TALBOT-SMITH, M. (1997) *Audio Explained*. Oxford: Focal Press
 SEAMAN, P. and Cline, J. (1996) *Website Sound*. : New Rivers Publishing.
 ESSEX, J. (1996) *Multimedia Sound and Music Studio*. : (Random House - New Media Series): Random House Electronic Pub

5) ASSESSMENT METHODS AND WEIGHTINGS:

This module will be assessed in two equally weighted elements. Please refer to the Modular Scheme Guide for you academic year for further information on module grade calculations.

6) ASSESSMENT DEADLINES:

See assignment briefs and assessment sheets.

7) PROCEDURE FOR REQUESTING EXTENSIONS:

Please refer to the Modular Scheme Guide for you academic year.

Part 2 of 2

8) ASSESSMENT CRITERIA:

The School has identified 6 Assessment Criteria, a number of which may be used in any given module, depending on the stated Learning Outcomes. **Specific criteria will appear on all assignment briefs.** The criteria have been designed to help you understand 'what' is being assessed in any assignment. Their presence will also help you identify what specific areas of your learning you need to improve and develop. These are:

1. Research
2. Problem Analysis
3. Working Methods
4. Application of Skills
5. Conceptual Development (Generation of Ideas)
6. Quality of Final Product (Visual)
Quality of Final Product (Written)
Quality of Final Product (Verbal Presentation)
Quality of Final Product (Interactive Media)

In order to pass the module, you will need to be able to demonstrate, depending on the task, some or all of the qualities described under each heading. These criteria will also be used in the assessment of negotiated or self-directed independent briefs. Where a module has more than one assessed components, each component must be passed. For further details of specific criteria please see subject & module guide.

9) ASSESSMENT TASKS: These are indicated on the assignment briefs.

10) SUBMISSION OF ASSIGNMENTS: This is indicated on the assignment briefs.

11) PROCEDURE OF RETURNED ASSIGNMENTS AND FEEDBACK:

Where possible assessment (component) feedback sheets will be returned 2 weeks after the assignment deadline. Assignments will be returned after external examination and subject board and the end of each semester.

12) RETRIEVING FAILURE:

Please refer to the Modular Scheme Guide for you academic year.

13) CHEATING AND PLAGIARISM:

Please refer to the Modular Scheme Guide for you academic year.

14) REGISTERING OF MODULE:

To register for this module, complete a module registration form and return it to Art and Design registry. ML block (Main Site) Room ML49

15) PRESCRIBED FEE FOR THIS MODULE: None

16) DATE OF ISSUE: Oct 2001

17) NAME(S) OF AUTHOR(S): Jim Davis

18) ACADEMIC YEAR(S) FOR WHICH GUIDE IS VALID: 2001/2002

19) CREDIT ENVELOPE

Please note that there is a maximum number of credits you are allowed to study in Part 1 (Level 1, 1st Year for full-time students) of your programme. The total number of modules that can be studied in Part 1 is 12 (180 credits).

Appendix 2 - Module learning and teaching activities

Appendix 2a - Week three taught session - group devised role-play questions

Examples of week three taught session - group devised role-play questions.
Taken from Iteration B, semester 2 academic year 2002 -2003

Group I

- What made you want to become a vegetarian?
- What aspect of eating meat or meat do you dislike?
- How would you feel if you had eaten a meat product by mistake?
- Do your friends ever harass you or try to encourage you to eat meat?
- Do you think that it is important to take vitamins to supplement your diet? If so why?

Group II

- How long have you been a vegetarian?
- Why did you decide to become a vegetarian?
- Do you feel that restaurants and supermarkets cater sufficiently for vegetarians?
- Do you believe that a strict vegetarian diet can provide all the vitamins and minerals that the human body requires?
- Do you think it is hypocritical for vegetarians to wear furs or leather?

Group III

- Why did you take the decision to become a vegetarian?
- Do you eat any form of meat or meat product at all? (Fish, scratchings)
- Do you feel that your diet lacks vital nutrients by not eating meat - If so, what measures do you take to ensure a healthy diet?
- How do you think that restaurants could improve in catering for vegetarians?
- If you were in a situation where meat was your only option would you eat it?

Appendix 2b - Examples of assignment 1 student work (located on the appendices CD-ROM)

The three files are located at the root of the CD-ROM, located on the next page. It should be possible to access these directly from the CD. If however you have difficulty playing the material, then please copy the contents to the hard drive of your computer.

Note: To play the audio files you will need a media player capable of playing '.wav' files such as Microsoft Windows Media Player. (Windows Media Player can be downloaded free of charge from:

<http://www.microsoft.com/windows/windowsmedia/default.msp>)

Or

Apple's iTunes, which can be downloaded free of charge from:

<http://www.apple.com/itunes/>

File: Student_A.wav

The sound file 'Student_A.wav' - This example is presented to illustrate poor microphone handling and control. Throughout the recording we can hear the student handling the microphone.

File: Student_B.wav

The sound file 'Student_B.wav' - This example is presented to illustrate problems with microphone placement. In this example we can hear what is termed 'piping', a form of distortion. This can be attributed to the microphone being placed too close to the mouth.

File: Student_C.wav

The sound file 'Student_C.wav' - This example is presented to illustrate poor awareness of background noise when conducting the interview. Throughout this example, we hear background music, present at the time of the interview. Listen closely and you will hear the music disjointed through the editing of the interview. When asked about the music the student replied "I didn't realise music was playing. I only noticed it when I came to transcribe the interview."

See preceding page for information about the contents of this CD-ROM.

Appendix 3 - Module cohort survey

Appendix 3a - Cohort profile, prior experience and module expectations

Part 1 of 2

Dm1006 - Introduction to Digital Sound - Week One Survey

Introduction to Digital Sound - Semester 2. Academic year 2002/2003.
Cohort profile, prior experience and module expectations.

Last Name:																					First Name:																				
Student ID No:																					Which module group are you in:	<input type="checkbox"/> Mon Eve	<input type="checkbox"/> Tues Eve	<input type="checkbox"/> Thurs PM																	

Which award are you studying? Animation Video Multimedia Communication Design for Multimedia Digital Media Other (Please specify in the space below) _____

1:0) Which age range do you fit into?
 18-20 21-24 25-30 31-35 35+

1:1) Have you ever had either a part-time or full time Job?
 Yes No

1:2) Have you ever studied or undertaken any media based course/training which includes sound recording?
 Yes No

1:3) Have you ever engaged in 'Role Play' as part of any type of study or training? - (This is a training method where people assume roles and act out events or situations.)
 Yes No

1:4) Have you ever been interviewed? - (e.g. as part of a job application or by a local paper or radio station.)
 Yes No

1:5) Have you ever listened to a recording of your own voice?
 Yes No

1:6) Have you ever used a handheld microphone to recorded sound?
 Yes No

1:7) Have you ever used a portable Mini Disk player or recorder? - (A high quality device used to play / record sound.)
 Yes No

2:0) Over the course of a year how often do you listen to radio dramas or radio documentaries?
 Never Occasionally Regularly

2:1) Over the course of a year how often do you view television 'Chat Shows' such as Parkinson or Friday Night with Jonathan Ross
 Never Occasionally Regularly

2:2) Over the course of a year how often do you view television 'News programmes' such as The Evening News, Regional News.
 Never Occasionally Regularly

2:3) Over the course of a year how often do you view television 'Current affairs programmes' such as Newsnight, Question Time, On the Record, Breakfast with Frost.
 Never Occasionally Regularly

Please turn over the page >

Version 1 - 27/01/03
Page 1 of 2

Part 2 of 2

Dm1006 - Introduction to Digital Sound - Week One Survey

Having had the first assignment presented and explained to you.

<p>3.1) How much guidance do you feel you will need with methods of conducting an interview?</p> <p> <input type="checkbox"/> None <input type="checkbox"/> An overview or refresher only <input type="checkbox"/> Explanation and demonstration <input type="checkbox"/> In-depth explanation and demonstration <input type="checkbox"/> Other (Please specify below) _____ </p>
<p>3.2) How much guidance do you feel you will need with using a Mini Disk Recorder?</p> <p> <input type="checkbox"/> None <input type="checkbox"/> An overview or refresher only <input type="checkbox"/> Explanation and demonstration <input type="checkbox"/> In-depth explanation and demonstration <input type="checkbox"/> Other (Please specify below) _____ </p>
<p>3.3) How much guidance do you feel you will need with copying sound recording from the Mini Disk recorder to a Computer?</p> <p> <input type="checkbox"/> None <input type="checkbox"/> An overview or refresher only <input type="checkbox"/> Explanation and demonstration <input type="checkbox"/> In-depth explanation and demonstration <input type="checkbox"/> Other (Please specify below) _____ </p>
<p>3.4) How much guidance do you feel you will need with using a microphone?</p> <p> <input type="checkbox"/> None <input type="checkbox"/> An overview or refresher only <input type="checkbox"/> Explanation and demonstration <input type="checkbox"/> In-depth explanation and demonstration <input type="checkbox"/> Other (Please specify below) _____ </p>
<p>3.5) How much guidance do you feel you need with using the sound editing software?</p> <p> <input type="checkbox"/> None <input type="checkbox"/> An overview or refresher only <input type="checkbox"/> Explanation and demonstration <input type="checkbox"/> In-depth explanation and demonstration <input type="checkbox"/> Other (Please specify below) _____ </p>

4:0) Below is a list of some of the assignment 1 tasks and activities. Place a number '8' in the box next to the task you feel will be most challenging for you and a '1' in the box next to the task you feel will be least challenging for you. Rank the remaining tasks from '7' to '2' based on how challenging you feel the task will be.

Assignment Tasks and Activities	Rank by order of difficulty from 8 to 1. (8 being the most difficult)	Ranking Example
Finding a person to interview.		7
Coming up with questions to ask.		8
Conducting the Interview		1
Using the Mini Disk Recorder.		8
Using the Microphone.		6
Recording the Interview.		4
Copying the Mini Disk recording to the computer.		5
Using the Sound Editing Software.		5

(The list to the right is an example only).

Once you have fully completed the questionnaire please hand it back to your module tutor.
Thank You.

Appendix 3b - Evaluation, reflection practice and resources

Part 1 of 2

Dm1006 - Introduction to Digital Sound - Week Seven Survey

Introduction to Digital Sound - Semester 2. Academic year 2002/2003.
Evaluation, reflection practice and resources.

Last Name:																					First Name:																				
Student ID No:																					Which module group are you in:	<input type="checkbox"/> Mon Eve	<input type="checkbox"/> Tues Eve	<input type="checkbox"/> Thurs PM																	

1:0) How many interviews did you record for assignment 1?
 One Two Three Four or more

1:1) How many questions did you prepare for the interview you recorded for assignment 1?
 None 1-5 6-10 10+

1:2) How long was the recording of the original interview you used for assignment 1?
 1-5 minutes 6 to 10 minutes 11 - 15 minutes 16 - 20 minutes 21 minutes +

2:0) Do you have access to a Mini Disk recorder other than the ones available from the University equipment store?
 Yes No

2:1) Did you use a University Mini Disk recorder or microphone in the completion of assignment 1?
 Yes No

2:2) How many times did you book out and collect University sound recording equipment for assignment 1?
 Once Twice Three Times 4 or more time

3:0) Did you practice using the Mini Disk recorder before recording the interview you used for assignment 1?
 Yes No

3:1) Before recording the interview, did you practise your interview **questions** on a family member, friend or colleague?
 Yes No

3:2) Before recording the interview, did you practise your interview **technique** on a family member, friend or colleague?
 Yes No

4:0) Does your original unedited interview recording for assignment 1 contain any **background noise or sound?**
 Yes a little Yes a lot No Don't Know

4:1) Does your original unedited interview recording for assignment 1 contain any **microphone** noise or sound?
 Yes a little Yes a lot No Don't Know

4:2) Overall how well do you think you have performed in assignment 1?
 Unsatisfactory performance Satisfactory performance Good performance Very good performance Outstanding performance

Please turn over the page >

Version 1 - 27/01/03
Page 1 of 2

Part 2 of 2

Dm1006 - Introduction to Digital Sound - Week Seven Survey

5:0) Below is a list of some of the assignment 1 tasks and activities you have completed. Place a number '8' in the box next to the task you feel was the most challenging for you and a '1' in the box next to the task you feel was least challenging for you. Rank the remaining tasks from '7' to '2' based on how challenging you feel the task was.

Assignment Tasks and Activities	Rank by order of difficulty from 8 to 1. (8 being the most difficult)	Ranking Example
Finding a person to interview.		7
Coming up with questions to ask.		8
Conducting the Interview		1
Using the Mini Disk Recorder.		8
Using the Microphone.		6
Recording the Interview.		4
Copying the Mini Disk recording to the computer.		5
Using the Sound Editing Software.		3

(The list to the right is an example only).

Considering the instruction and guidance you have had for the first assignment so far:

6:0) Do you feel you had sufficient time to practise using the recording equipment?
 Yes No

6:1) Do you feel you were adequately prepared in class to be able to undertake the interview?
 Yes No

6:2) Would you like the opportunity to practise sound recording and interview techniques in class?
 Yes No

6:2) In your opinion could the support and guidance for this assignment be improved?
 No Yes (If yes - could you please outline any ideas you have in the space provided below).

Once you have fully completed the questionnaire please hand it back to your module tutor.
 Thank You.

Appendix 4 - Providers' survey

Part 1 of 2

Study And Training Providers - Practice and Delivery	
Conducting and recording audio interviews	
Name of Institution / Organisation:	
Your Title and Name:	
Your Email Address:	
Contact Telephone Number:	
<p>1:0) Does your institution offer instruction/study at undergraduate level in the skills associated with conducting and audio recording interviews?</p> <p><input type="checkbox"/> No (Please continue on to section 2 below) <input type="checkbox"/> Yes <i>If your answer is yes could you please list the awards accessing this instruction in the space provided below:</i></p>	
<p>1:1) Each academic year approximately how many students undertake instruction/study in conducting and audio recording interviews?</p> <p><input type="checkbox"/> 1-20 <input type="checkbox"/> 21-35 <input type="checkbox"/> 36-45 <input type="checkbox"/> 46-55 <input type="checkbox"/> 56+</p>	
<p>1:2) If the instruction/study is delivered in smaller groups (classes) approximately how large are these groups of students?</p> <p><input type="checkbox"/> 1-20 <input type="checkbox"/> 21-30 <input type="checkbox"/> 31-40 <input type="checkbox"/> 41+</p>	
<p>1:3) Before commencing their study with your institution, approximately how many of your students have undertaken prior study or training in either journalism, audio/time based media or media studies?</p> <p><input type="checkbox"/> Less than 10% <input type="checkbox"/> 11% - 25% <input type="checkbox"/> 26% - 50% <input type="checkbox"/> 51% - 75% <input type="checkbox"/> 76% - 100%</p>	
<p>1:4) At what level(s) does your institution deliver instruction/study in conducting and audio recording interviews?</p> <p><input type="checkbox"/> Introductory <input type="checkbox"/> Intermediate <input type="checkbox"/> Advanced</p>	
<p>2:0) In assessing the performance of students conducting and audio recording interviews what weighting would/do you place on the students ability to demonstrate A) theoretical understanding, B) Skills in the practical application?</p> <p>_____ % Theoretical understanding _____ % Practical Skills Total 100%</p>	
<p>2:1) In introducing/developing a students understanding/skills in conducting and audio recording interviews, do/would you utilise any of the methods/resources listed below? (Please tick as appropriate)</p> <p><input type="checkbox"/> Demonstration Utilising Lecturer to Student Role Play <input type="checkbox"/> Student - Student Role Play <input type="checkbox"/> Use computer based learning material. (Including CD-ROM and web) <input type="checkbox"/> Provide printed notes or summary information. <input type="checkbox"/> Refer to published material, articles, books, manuals.</p> <p><input type="checkbox"/> Show the work of students from earlier years. <input type="checkbox"/> Show pre-recorded broadcast examples. (TV, Radio) <input type="checkbox"/> Other(s) Please provide a brief outline below</p>	
<p>2:2) Which method of assessment activity do/would you employ.</p> <p><input type="checkbox"/> Set practical exercises during study session. <input type="checkbox"/> Set practical assignments, or tasks. To be completed outside the study session. <input type="checkbox"/> Written test <input type="checkbox"/> Other Please specify in the space below.</p>	
<p>Version 1 - 28/02/03 Page 1 of 2</p>	

Part 2 of 2

Study And Training Providers - Practice and Delivery

2.3) Including both class contact and independent study time approximately how many hours in total do/would you expect students to spend studying for conducting and audio recording interviews?
 _____Hours Minimum

2.4) Which published literature do/would you recommend students read in support of their study in this area?
 Please provide where possible Author / Title / ISBN in the space below.

2.5) Are you familiar with any computer-based interview and or sound recording simulator training programmes?
 No Yes *If your answer is yes could you please give an outline of the material in the space provided below:*

Please indicate the degree to which you either agree or disagree with the following statements:

3:0) Practice is the most important factor in developing skills in conducting and audio recording interviews.
 Strongly Disagree Disagree Agree Strongly Agree

3.1) Classroom/studio-based activities offer only limited opportunities to develop skills in conducting and audio recording interviews.
 Strongly Disagree Disagree Agree Strongly Agree

3.2) It is more important to develop a student's interview technique over recording technique.
 Strongly Disagree Disagree Agree Strongly Agree

3.4) Access to a wider variety of audio recording resources such as variety of microphone types would **NOT** contribute to an enhanced understanding by students of the interview recording process.
 Strongly Disagree Disagree Agree Strongly Agree

4:0) Mark in order of priority (1 being the highest priority and 12 being the lowest) the skills you feel students need to acquire/develop at an **introductory** level in conducting and audio recording an interview.

<input type="checkbox"/> Interview preparation	<input type="checkbox"/> Identifying opportunities for follow up questions during an interview.	<input type="checkbox"/> Monitoring recording levels during an interview
<input type="checkbox"/> Monitor and compensate for background noise during an interview	<input type="checkbox"/> Choosing an appropriate microphone type	<input type="checkbox"/> Microphone placement and control
<input type="checkbox"/> Assessing the suitability of a potential interview location	<input type="checkbox"/> Listening skills	<input type="checkbox"/> Communication Skills
<input type="checkbox"/> Body language - Providing non audible encouragement during interview	<input type="checkbox"/> Handling the recording device, minidisk DAT etc.	<input type="checkbox"/> Sound editing skills

<p>5:0) Would you be willing to participate in a follow up telephone interview arranged at your convenience? <input type="checkbox"/> No <input type="checkbox"/> Yes</p>	<p>5:1) Would you prefer to have you and your institution's identity masked in the shared collated data file to be made available to all questionnaire respondents. <input type="checkbox"/> No <input type="checkbox"/> Yes</p>
---	--

Thank you for your participation. Please could you return the completed Questionnaire in the stamped addressed envelop provided. Additional information and an online copy of this survey is available @ <http://www.undertheblue.net/>

Version 1 - 28/02/03
Page 2 of 2

Appendix 5 - Field trial second survey (week 7)

Page 1 of 4

Dm1006 - Introduction to Digital Sound - Survey Part Two

Introduction to Digital Sound - Semester 2. Academic year 2005/2006.
Evaluation, reflection practice and resources.

Last Name:																					First Name:																				
Student ID No:																					Who is you Module Tutor:			<input type="checkbox"/> Jim	<input type="checkbox"/> Mark	<input type="checkbox"/> Other															

About the Assignment:

1:0) How many interviews did you record for assignment 1?
 One Two Three Four or more

1:1) How many questions did you prepare for the interview you recorded for assignment 1?
 None 1-5 6- 10 11+

1:2) How long was the recording of the original interview you used for assignment 1?
 1 - 5 minutes 6 to 10 minutes 11 - 15 minutes 16 - 20 minutes 21 minutes +

2:0) Do you have access to a Mini Disk recorder other than the ones available form the University equipment store?
 Yes No

2:1) Did you use a University Mini Disk recorder or microphone in the completion of assignment 1?
 Yes No

2:2) How many times did you book out and collect University sound recording equipment for assignment 1?
 Once Twice Three Times 4 or more time Never. I used my own / friends equipment

3:0) Did you practice using a real Mini Disk recorder before recording the interview you used for assignment 1?
 Yes No

3:1) Before recording the interview, did you practise your interview Questions on a family member, friend or colleague?
 Yes No

3:2) Before recording the interview, did you practise your interview Technique on a family member, friend or colleague?
 Yes No

4:0) Does your original un-edited interview recording for assignment 1 contain any background noise or sound?
 Yes a little Yes a lot No Don't Know

4:1) Does your original un-edited interview recording for assignment 1 contain any microphone noise or sound?
 Yes a little Yes a lot No Don't Know

4:2) Overall how well do you think you have performed in assignment 1?
 Unsatisfactory performance Satisfactory performance Good performance Very good performance Outstanding performance

Please turn over the page >

Version 1 -01/09/2005
Page 1 of 4

Dm1006 - Introduction to Digital Sound - Survey Part Two

About the Assignment Tasks Continued:

5.0) Below is a list of some of the first assignment tasks and activities you have undertaken.

5.1) Write the number '8' in the box next to the task you feel was the most challenging.

5.2) Write '1' in the box next to the task you feel was the least challenging for you.

5.3) In the reaming blank boxes below rank the all the other tasks from '7' to '2' based on how challenging you feel the tasks were. (The higher the number the more challenging the task was.)

Assignment Tasks and Activities	Rank		Ranking Example
Finding a person to interview.			7
Coming up with questions to ask.		8 - Most Challenging	2
Conducting the Interview		7 -	1
Using the Mini Disk Recorder.		6 -	3
Using the Microphone.		5 -	6
Recording the Interview.		4 -	4
Copying the Mini Disk recording to the computer.		3 -	5
Using the Sound Editing Software.		2 -	3
		1 - Least Challenging	

Study Experience - (Recording Coach):

6.0) Did you use the 'Recording Coach' computer programme introduced to you by your tutor in week 3?

No Yes

(Go to question 6.1 below) (Please skip the next question and move on to question 7 on the next page and continue to answer the remaining survey questions.)

6.1) Why didn't you use the Recording Coach Programme?

I did not attend the week three class when the programme was introduced. Found the programme too difficult to use. Could not find the programme on the computer. Other Please Specify Below

6.2) Please now move to question 9 and continue to answer the remaining survey questions

Dm1006 - Introduction to Digital Sound - Survey Part Two

Using Recording Coach Part 1:

7:0) On how many different occasions did you use the Recording Coach programme?
 Once only Twice Three Times 4 or more time

7:1) Did you ever use Recording Coach outside of class times?
 Yes No

7:2) Which sections of Recording Coach have you looked at / used.
 PLEASE tick as appropriate: Introduction Equipment Demonstration Sound Kit Set-up activity
 Assisted Interview activity - (Interview with my Colleague). Interview Assignment activity - (Interview with Margaret Weatherby).

7:3) Did you ever try working together with another student on any of Recording Coach's tasks or activities?
 Yes No

7:4) When using Recording Coach, In total, how many times did you interview Margaret Weatherby?
 None Once Twice Three Times 4 or more time

7:5) Using Recording Coach, did you manage to produce an audio recording of your interview with Margaret Weatherby?
 Yes No Don't Know

7:6) Did you ever listen back to any of the interview recording/s you produced with Recording Coach?
(The recordings are produced when you successfully set up the sound kit and interview Margaret Weatherby.)
 Yes No

7:7) Did you find out Margaret Weatherby's secret?
 Yes No Don't Know

7:8) Did you access the 'OpenEye' web site containing information on Margaret Weatherby?
 Yes No

Using Recording Coach Part 2:

8:0) How easy did you find Recording Coach to use?
 Recording Coach was very difficult to use Recording coach was a little difficult to use Recording Coach was easy to use. Recording Coach was very easy to use

8:1) Did Recording coach ever crash / stop working while you were using it?
 No Yes *(If you can remember please indicate when it crashed below)*

8:2) Was Recording Coach helpful in preparing you to undertake the assignment?
 Yes No
(please briefly explain why you felt it was not helpful)

8:3) Did you enjoy using Recording Coach?
 No The programme was a waste of time. No didn't like using the programme. Yes I enjoyed most of the programme. Yes I enjoyed using the programme very much

Please go to the next page >

Version 1 -01/08/2005
Page 3 of 4

Appendix 6 - Semi-structured discussion group, primary questions

Study

- 1) Would it be possible to study the module using the web site material and Recording Coach without attending any of the sessions? - Why?
- 2) From my perspective, it seems often that students spend very little time studying outside class time in the early part of the module. Am I wrong?

Time

- 3) Is there enough time to practise before being assessed for the first assignment?

Recording Coach

- 4) Was Recording Coach at all helpful? - Why?
- 5) I anticipated that you guys would use Recording Coach several times throughout the module but this did not generally happen. Do you have any ideas why it wasn't used after the initial session?
- 6) Do you agree or disagree with the following statements:
 - 6a) Using Recording Coach prepares students for the assignment.
 - 6b) Using Recording Coach helps students have a better understanding of recording issues.
 - 6c) Using Recording Coach helps students to achieve a better grade in their first assignment.

Improvements

- 7) If I could do one thing to help improve your performance what would it be?

Appendix 7 - RecordingCoach activity log

Please note that the student numbers have been replaced with 'STUDENT A/B/C' etc to maintain participant anonymity.

Semester 1 - Room ML041 - Computer Number 1

{START 27/09/2005 ~ 10:44 } {Terminate:10:44 }

{START 20/10/2005 ~ 11:39 } {SN STUDENT A} {introduction:11:41 } {practice:11:42 } {Kit Demo:11:42}
 {practice:11:42} {Kit Demo:11:42 } {practice:11:42 } {Kit Set-up:11:42 } {practice:11:44 } {Assisted:11:44 }
 {assignment:11:48 } {assignment:12:10 } {assignment:12:16 } {assignment:12:22 } {practice:12:28 } {Assisted:12:28}
 {END12:33 }

{START 20/10/2005 ~ 15:41 }

{START 20/10/2005 ~ 15:42 } {SN STUDENT B} {introduction:15:43 } {practice:15:50 } {Kit Demo:15:51 }
 {assignment:15:59 } {END16:28 }

{START 04/11/2005 ~ 14:17 } {SN STUDENT C} {assignment:14:17 }

Semester 2 ML041 - Computer Number 1

{START 21/02/2006 ~ 15:23 } {SN STUDENT D} {introduction:15:24 } {practice:15:30 } {Kit Demo:15:30 } {Kit Set-
 up:15:38 } {Assisted:15:40 } {assignment:15:47 } {assignment:15:57 } {assignment:16:05 }

{START 21/02/2006 ~ 16:10 } {SN STUDENT D} {assignment:16:10 } {assignment:16:21 } {assignment:16:25 }

{START 21/02/2006 ~ 16:35 } {SN STUDENT D} {assignment:16:35 } {END16:41}

{START 24/02/2006 ~ 15:44 } {SN STUDENT E} {introduction:15:45 } {practice:15:59 } {Kit Demo:15:59 } {Kit Set-
 up:16:00 } {Assisted:16:04 } {assignment:16:11 } {assignment:16:33 } {END16:44 }

{START 27/02/2006 ~ 13:04 }

Glossary of abbreviations

AC	Abstract Conceptualisation (Kolb's Learning Cycle)
AE	Active Experimentation (Kolb's Learning Cycle)
ALC	Automatic Level Control
AR	Action Research
CBT	Computer-Based Training
CBL	Computer-Based Learning
CD	Compact Disc
CE	Concrete Experience (Kolb's Learning Cycle)
CFS	Microsoft Combat Flight Simulator (WWII Series)
DEL	Department for Employment and Learning
DM1006	Level one undergraduate module entitled 'Introduction to Digital Sound'
FDTL	Fund for the Development of Teaching and Learning
GAO	Generic Academic Outcomes
HCI	Human Computer Interaction
HEFCE	Higher Education Funding Council for England
MIT	Massachusetts Institute of Technology
PC	Personal Computer
PTS	Personal Transferable Skills
RO	Reflective Observation (Kolb's Learning Cycle)
ROI	Return On Investment
SA	Situation Awareness
SME / SMEs	Subject Matter Expert / Subject Matter Experts
SRIT	Sound Recording and Interview Techniques
SSO	Subject Specific Outcomes
TLTP	Teaching and Learning Technology Programme
TSL	Technology Supported Learning
UTG	User Testing Group
VLE	Virtual Learning Environment

Glossary of terms

CD Extra	Compact disk format which allows CD audio files and personal computer data to coexist on a single disk
DVD	Digital Versatile Disk. Also known as - Digital Video Disk

Table of figures

Figure 1 Framing of this multi- and inter-disciplinary practice-based research project	21
Figure 2 Kolb's structural dimensions underlying the process of experiential learning and the resulting basic knowledge forms. (Reproduced from Kolb 1984, p42).....	26
Figure 3. The relationship (afforded by TSL) between a product-based concern for UXD and learning and teaching.....	40
Figure 4 Jesse James Garrett - elements of user experience model.....	44
Figure 5 Aldrich's (2005) Educational simulations and tangential spaces	61
Figure 6. Weekly lesson schedule.....	71
Figure 7 Students devising interview questions for the role-play activity during the week three session.....	74
Figure 8 Tutor-Student role-play during week three session.....	75
Figure 9. Cohort survey part one - Viewing and listening habits of module cohort.....	78
Figure 10 Cohort survey part one - Rank table for use of audio software.....	79
Figure 11 Cohort survey part one - Pie chart illustrating the results of the rank table for use of audio software.	79
Figure 12 Cohort survey part one - Rank table for use of minidisk recorder.....	80
Figure 13 Cohort survey part one - Pie chart illustrating the results of the rank table for the use of minidisk recorder.	80
Figure 14 Cohort survey part one - Table matrix of respondents' anticipated level of guidance needed.	81
Figure 15 Cohort survey part two - Pie chart illustrating the number of questions prepared for interview by students.	82
Figure 16 Cohort survey part two - Table cross-tabulation of number of questions prepared / Practice interview questions / Practice interview technique and criteria grade - Recording and Editing.....	83
Figure 17 Cohort survey part two - Pie chart illustrating the number of separate interviews conducted by students.....	84
Figure 18 Cohort survey part two - Cross-tabulation of Overall element 1 grade / Performance self evaluation.	85
Figure 19 Online Survey @ http://www.undertheblue.net/survey/provider1	92
Figure 20 Research Project Web Site http://www.undertheblue.net	93
Figure 21 Study and Training Providers Survey - Award cohorts' prior experience of media studies.....	93
Figure 22 Provider Survey - Teaching Methods and Resources.	94
Figure 23 Provider Survey - Table of ranking order for introductory SRIT skills....	96
Figure 24 A summary table of SRIT tasks.....	100
Figure 25 DM1006 Needs Analysis Summary.	102
Figure 26 DM1006 - Class and independent study learning environment.	109

Figure 27 Student focus group and usability testing session.	114
Figure 28 Jabberwacky Chatterbot - Copyright 2006 Televirtual Ltd.	118
Figure 29 RecordingCoach input interface zones (denoted by the unmasked area).	126
Figure 30 Input device zone incursions (denoted by the unmasked area).....	127
Figure 31 Screen shots from Myst IV Revelation (Copyright Cyan Inc.).....	134
Figure 32 RecordingCoach blue screen during final production shoot.	135
Figure 33 Preliminary evaluation matrix	147
Figure 34 October field trial - week three session, final hour.	148
Figure 35 Open-eye.co.uk - dummy celebrity website.	149
Figure 36 RecordingCoach ease of use - percentage of users.....	153
Figure 37 Percentage of students who enjoyed using RecordingCoach.	156
Figure 38 The percentage of students who used RecordingCoach outside scheduled class time.	156
Figure 39 The number of simulated interviews conducted by students with Margaret (number of students, percentage of cohort).	158
Figure 40 The number of sound kit bookings by percentage of cohort.	161
Figure 41 The number of 'real' interviews carried out by students.	162
Figure 42 Number of questions prepared for the interview.	162
Figure 43 Length of original interview recording.	163
Figure 44 Student performance element 1 (assignment) and assessment criteria grades from 2000 to 2005 - 06.	165
Figure 45 The worst aspects of RecordingCoach.	169
Figure 46 The best aspects of RecordingCoach.	171
Figure 47 Seeing Drawing - Screen shot of the programme Main Menu.	259
Figure 48 Seeing Drawing - Screen shots of the activities presented in the Introduction element of seeing as reflection.	261
Figure 49 Seeing Drawing - Screen shot of the final screen of the introduction element of seeing as reflection.	261
Figure 50 Doors of Perception CD-ROM - Agreeing or disagreeing with a speaker.	263
Figure 51 Seeing Drawing - Gallery activity of the "Truth" element of seeing as reflection.	263
Figure 52 Seeing Drawing - Reviewing selected gallery images with the "Truth" element of seeing as reflection.	264
Figure 53 Seeing Drawing - Creating an image 'Truth' element of seeing as reflection.	264
Figure 54 Seeing Drawing - Print out option and the end of the 'Truth' element in the drawing as reflection section.	265
Figure 55 Seeing Drawing - Repeat activity comparing proportions and perspective, 'Eye' element in the drawing as reflection section.	268

Figure 56 Seeing Drawing - Concluding exercise route 'A' video sequence 'Eye' element in the drawing as reflection section.....	269
Figure 57 Seeing Drawing - Concluding exercise route 'A' exercise 'Eye' element in the drawing as reflection section.	269
Figure 58 Seeing Drawing - Concluding exercise route 'B' video sequence 'Eye' element in the drawing as reflection section.....	270
Figure 59 Seeing Drawing - Concluding exercise route 'B' exercise 'Eye' element in the drawing as reflection section.	270
Figure 60 Seeing Drawing - Concluding exercise route 'C' video sequence 'Eye' element in the drawing as reflection section.....	271
Figure 61 Seeing Drawing - Concluding exercise route 'C' computer emulation 'Eye' element in the drawing as reflection section.....	272
Figure 62 Seeing Drawing - Concluding gallery page 'beholder' element in the drawing as reflection section.	273
Figure 63 Artist! - Main and Other Menus.	277
Figure 64 Artist! - Hand Tools Video Demonstration.....	277
Figure 65 Artist! - Perspective Topic and Activity Map.....	278
Figure 66 Artist! - Sketching Memorisation Course.....	278
Figure 67 Artist! - Model Selection in the Nude Studies Drawing Genre.	279
Figure 68 Artist! - Flexible Content Presentation 1.....	280
Figure 69 Artist! - Flexible Content Presentation 2.....	281
Figure 70 Artist! - Comparing Works.	282
Figure 71 Easy Drums - Main Menu and Instrument Section.....	283
Figure 72 Easy Drums - Basic Lesson Menu and Overview.	283
Figure 73 Easy Drums - Basic and Advanced Lessons.	284
Figure 74 The Way Things Work - David Macaulay virtual tutor. Copyright Dorling Kindersley	285
Figure 75 Aerosmith Nine Lives - CD Extra 1.....	286
Figure 76 Aerosmith Nine Lives - CD Extra 2.....	287
Figure 77 Microsoft Combat Flight Simulator - Main Menu Screen.	288
Figure 78 Microsoft Combat Flight Simulator - Training Missions.....	289
Figure 79 Microsoft Combat Flight Simulator - The Different Activity Menus.....	289
Figure 80 Microsoft Combat Flight Simulator - Campaigns, Debrief, Pilot Log & Killed in Action Screens.	290
Figure 81 Microsoft Combat Flight Simulator - Settings.....	290
Figure 82 Microsoft Combat Flight Simulator - Enemy Aircraft Identification Option.	291
Figure 83 Microsoft Combat flight Simulator - First Person Perspective Options.....	292
Figure 84 Microsoft Combat Flight Simulator - Multiple First and Third Person Perspective.	293
Figure 85 Microsoft Combat Flight Simulator - Mouse and Keyboard Commands.	294

Figure 86 Microsoft Combat Flight Simulator - Defining Pilot & Enemy Settings.	295
Figure 87 RecordingCoach - loading screen.....	376
Figure 88 RecordingCoach - pen, paper and headphones prompt.....	377
Figure 89 RecordingCoach - user name input.	377
Figure 90 RecordingCoach - main menu.....	377
Figure 91 RecordingCoach - introduction.....	378
Figure 92 RecordingCoach - control panel.....	378
Figure 93 RecordingCoach - main menu confirmation.....	379
Figure 94 RecordingCoach - main menu return.	379
Figure 95 RecordingCoach - practice sub menu.....	379
Figure 96 RecordingCoach - sound kit demonstration.....	380
Figure 97 RecordingCoach - sound kit demonstration dual images.	380
Figure 98 RecordingCoach - control panel with practice menu navigation button.	381
Figure 99 RecordingCoach - practice menu confirmation.	381
Figure 100 RecordingCoach - practice menu return.	381
Figure 101 RecordingCoach - sound kit set-up introduction.	382
Figure 102 RecordingCoach - sound kit set-up starting point.	382
Figure 103 RecordingCoach - sound kit set-up the first battery.....	382
Figure 104 RecordingCoach - sound kit set-up the second battery.	383
Figure 105 RecordingCoach - sound kit set-up the headphone plugged in part one.	383
Figure 106 RecordingCoach - sound kit set-up the headphone plugged in, part two.	383
Figure 107 RecordingCoach - sound kit set-up the headphone and microphone are plugged in.	384
Figure 108 RecordingCoach - sound kit set-up the headphone monitoring selection (how to wear the headphones).	384
Figure 109 RecordingCoach - sound kit set-up activity feedback.	384
Figure 110 RecordingCoach - practice menu.....	385
Figure 111 RecordingCoach - assisted interview introduction.	385
Figure 112 RecordingCoach - assisted interview microphone selection.....	386
Figure 113 RecordingCoach - assisted interview preset-up sound kit and headphone monitoring.....	386
Figure 114 RecordingCoach - assisted interview virtual interviewee.....	386
Figure 115 RecordingCoach - assisted interview summary feedback.	387
Figure 116 RecordingCoach - main menu link to 'take an assignment'.	387
Figure 117 RecordingCoach - interview assignment: introduction.	387
Figure 118 RecordingCoach - interview assignment: question selection introduction.	388
Figure 119 RecordingCoach - interview assignment: question selection start.....	388
Figure 120 RecordingCoach - interview assignment: question selection finish. ...	389

Figure 121 RecordingCoach - interview assignment: microphone selection.	389
Figure 122 RecordingCoach - interview assignment: introducing the interview controls.	390
Figure 123 RecordingCoach - interview assignment: arrival at the 'Elmore Dock Café'.....	390
Figure 124 RecordingCoach - interview assignment: sound kit set-up.	391
Figure 125 RecordingCoach - interview assignment: Margaret arrives.	391
Figure 126 RecordingCoach - interview assignment: hand held mic placement.	392
Figure 127 RecordingCoach - interview assignment: Margaret challenges the interviewer about their preparation.	393
Figure 128 RecordingCoach - interview assignment: Margaret tests the interviewer.	393
Figure 129 RecordingCoach - interview assignment: Margaret praises the interviewer's knowledge of her.	394
Figure 130 RecordingCoach - interview assignment: follow up questions part 1.	394
Figure 131 RecordingCoach - interview assignment: follow up questions part 2.	394
Figure 132 RecordingCoach - interview assignment: follow up questions part 3.	395
Figure 133 RecordingCoach - interview assignment: Margaret's mood begins to improve.	395
Figure 134 RecordingCoach - interview assignment: probing Margaret about her secret, part 1.	396
Figure 135 RecordingCoach - interview assignment: probing Margaret about her secret, part 2.	396
Figure 136 RecordingCoach - interview assignment: probing Margaret about her secret, part 3.	396
Figure 137 RecordingCoach - interview assignment: a car alarm sounds.	397
Figure 138 RecordingCoach - interview assignment: pausing the interview until the car alarm stops.	397
Figure 139 RecordingCoach - interview assignment: dropping the microphone.	398
Figure 140 RecordingCoach - interview assignment: Margaret storms out.	398
Figure 141 RecordingCoach - interview assignment: the first 'Easter Egg'.	399
Figure 142 RecordingCoach - interview assignment: the second 'Easter Egg'....	399
Figure 143 RecordingCoach - interview assignment: debriefing.	399
Figure 144 RecordingCoach - credits and 'la vie en rose'.	400

Bibliography

- Aamodt, A. (1995) *Knowledge acquisition and learning by experience - the role of case-specific knowledge* [online]. [cited 24 October 2001].
<<ftp://ftp.ifi.ntnu.no/pub/Publikasjoner/vitenskaplige-artikler/kaml-book-95.pdf>>.
- Aardman Animation UK. (2000) *Aardman Classics* [DVD]. Momentum Pictures Home Entertainment.
- Adams, D. M. (1973) *Simulation games: an approach to learning*. Worthington, Ohio: C.A. Jones Publishing.
- Adams, S. and Hicks, W. (2001) *Interviewing for journalists*. London: Routledge.
- Adams-Spink, G. (2005) *Blind gamers get their own titles* [online]. BBC News UK Edition [cited 1 February 2005].
<<http://news.bbc.co.uk/1/hi/technology/4112725.stm>>.
- Aldrich, C. (2003) *Simulations and the future of learning: an innovative (and perhaps revolutionary) approach to e-learning*. USA: Pfeiffer.
- Aldrich, C. (2005) *Learning by doing. A comprehensive guide to simulations, computer games and pedagogy in e-learning and other educational experiences*. USA: Pfeiffer.
- Anderson, J. R. (1990) *The adaptive character of thought*. Lawrence Erlbaum.
- Armitage, S., Bryson, M., Creanor, L., Higgison, C., Jenkins, M., Ringan, N., Newland, B., Prescott, D., and Yip, H. (2004) *Proceedings: Networked Learning Conference 2004*. UK: Lancaster University / University of Sheffield.
- Atkinson, D. (1995) *Sound production handbook*. London: Blueprint - Chapman & Hall.
- Bannon, L.J. (1991) From human factors to human actors - the role of psychology and human-computer interaction studies in systems design. In: Greenbaum, J. and Kyng, M., (eds.) *Design at work: cooperative design of computer systems*. USA, Hillsdale: Lawrence Erlbaum Associates, pp. 25-44.
- Barfield, L. (2004) *Design for new media interaction design for new media and the web*. Edinburgh: Pearson Education Limited.

Barlow, D. (1998) Black box - blaming the pilot [TV broadcast]. UK, Discovery Communications. [Aired on Sky Discovery Channel, length 56 minutes. Part of the Black Box series.]

Bass, E.J., Zenyuh, J.P., Small, R.L. and Fortin, S.T. (1996) A context-based approach to training situation awareness. *In: IEEE Computer Society (1996) Proceedings: HICS '96 - Third Annual Symposium on Human Interaction with Complex Systems*. Los Alamitos, CA: IEEE Computer Society, pp.89-96. Also available online: Search Technology [cited 4 September 2003].
<<http://www.searchtech.com/articles/hics96.htm>>.

BBC Television Training. (1991a) Music and sound effects for television training [VHS tape]. Producer John Mansfield. UK: BBC Television Training, length 30 minutes, out of print.

BBC Television Training. (1991b) *On Camera - Programme 6 - Sound* [VHS recording]. Producer Harris Watts. UK: BBC. (Part of the On Camera Series, length 30 mins.)

BBC Television Training. (no date) The language of film - the soundtrack [VHS tape]. Producer Gordon Croton. UK: BBC Television Training, length 30 minutes, out of print.

BBC Training and Development. (2003) *Interviewing for radio* [online]. [cited 29 May 2004]. <<http://www.bbctraining.com/onlineCourse.asp?tID=2555&cat=3>>.

BBC Training and Development. (2003) *Microphones and sound for radio* [online]. British Broadcasting Corporation [cited 29 May 2004].
<<http://www.bbctraining.com/onlineCourse.asp?tID=2508&cat=3>>.

BBC. (2000) Master class: making documentaries - Molly Dineen [TV broadcast]. Producer Judith Nichol. UK, British Broadcasting Corporation. Aired February 2001, on BBC Knowledge, length: 29 minutes.

BBC. (2003) *Midweek: interview with Professor Martin Conway, Durham University* [radio broadcast]. Aired 20 March 2003 on UK BBC Radio 4, length 25 minutes.

BBC. (2004) *File on Four - No confidence in new NHS computer* [radio broadcast]. Aired 19 October 2004 on UK BBC Radio 4, length 40 minutes.

BBC. (2004) *Lab to study emotion of gaming* [online]. BBC News UK Edition [cited 1 February 2005]. <<http://news.bbc.co.uk/1/hi/scotland/4098899.stm>>.

- BBC. (2006) *Student work rates 'vary widely'* [online]. BBC News On-Line [cited 31 October 2006]. <<http://news.bbc.co.uk/1/hi/education/6099768.stm>>.
- Beaman, J. (2000) *Interviewing for radio*. London: Routledge.
- Beardon, C. (1998) From information to virtuality: redefining computing for art and design practices. *Point - Art and Design Research Journal*, 1998(5), pp.26-31.
- Beetham, H. (2007) An approach to learning activity design in Beetham, H. and Sharpe, R. (eds.) *Rethinking Pedagogy for a Digital Age Designing and delivering e-learning*. London: Routledge pp.26-40.
- Beetham, H. and Sharpe, R. (2007a) *Rethinking Pedagogy for a Digital Age Designing and delivering e-learning*. London: Routledge.
- Beetham, H. and Sharpe, R. (2007b) An introduction to rethinking pedagogy for a digital age. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge, pp.1-10.
- Bekhradnia, B., Whitnall, C. and Sastry, T. (2006) *The academic experience of students in English universities*. Higher Education Policy Institute Report.
- Bell, H.H. and Lyon, D.R. (2000) Using observer ratings to assess situation awareness. In: Endsley, M.R. and Garland, D.J. (eds.) *Situation awareness analysis and measurement*. London: Lawrence Erlbaum Associates, pp.129-146.
- Bell, J. (2000) *Doing your research project - A guide for first-time researchers in education and social science*. 3rd ed., UK: Open University Press.
- Benyon, D., Turner, P. and Turner, S. (2005) *Designing interactive systems - People, activities, contexts, technologies*. Edinburgh: Pearson Education Limited.
- Bernard, H.W. (1954) *Psychology of teaching and learning*. London: McGraw-Hill.
- Bersin, J. (2004) *The blended learning book: best practices, proven methodologies, and lessons learned*. USA: Pfeiffer.
- Bigge, M.L. and Shermis, S.S. (1992) *Learning theories for teachers*. 5th ed., New York: Harper Collins.
- Bill, D.T. (1997) *Popular theory supporting the use of computer simulation for experiential learning* [online]. Centurion Systems [cited 8 September 2004]. <<http://www.centurionsys.com/rtcl57.html>>.

- Bird, E. (1992) *The development of art and design education in the United Kingdom in the 19th century*. Ph.D thesis (two volumes). UK: Loughborough University.
- Black, E. (no date) *Behaviourism as a learning theory* [online]. University of Houston Clear Lake [cited 19 September 2001].
<<http://129.7.160.115/inst5931/Behaviorism.html>>.
- Block, J.H. (1971) *Mastery learning - theory and practice*. New York: Holt, Rinehart and Winston.
- Bolles, R.C. (1979) *Learning theory*. 2nd ed., New York: Holt, Rinehart and Winston.
- Bolt, B. (2006) *Materializing pedagogies. Working papers in art and design 4*. [online]. [cited 17 November 2007].
<<http://www.herts.ac.uk/artdes/research/papers/wpades/vol4/bbfull.html>>.
- Bloom, B. S. (1956) *Taxonomy of educational objectives*. London: Longman.
- Bowling, A. (1997) *Research methods in health - investigating health and health services*. UK: Open University Press.
- Boyd, A. (2001) *Broadcast journalism - techniques of radio and television news*. 5th ed., London: Focal Press.
- Boyd-Barrett, O. and Scanlon, E. (1990) *Computers and learning*. England: Addison Wesley.
- Boyle, T. (2002) Towards a theoretical base for educational multimedia design. *Journal of Interactive Media in Education*, 2002 (2).
- Boyle, T. (2003) Design principles for authoring dynamic, reusable learning objects. *Australian Journal of Educational Technology*, 19(1), pp.46-58.
- Boucharenc, C. G. (2006) Research on basic design education: an international survey. *International Journal of Technology and Design Education*, 16(1), pp.1-30.
- Bradley, C. and Boyle, T. (2004) Students' use of learning objects. *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, 6(2).
- Brett, P. (2002) *Supporting learning with technology* [online]. University of Wolverhampton [cited 11 August 2002].
<http://www.wlv.ac.uk/celt/documents/tsl_support_guidelines.htm>.

- Brigden, A. (2001) *Dyslexia in HE art and design: a creative opportunity* [online]. British Dyslexia Association, 5th BDA International Conference, 18-21 April 2001, University of York, UK [cited 23 April 2001].
<http://www.bdainternationalconference.org/abstracts/bda_211.shtml>.
- Britain, S. (2007) Learning design systems. Current and future developments. In: Betham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge pp.103-114.
- Brookes, P. (2006) *Observations made last year about how students now handle the sound-kits* [email]. Message to Jim Davis. Stored on Jim Davis's home email system. Personal communication from Paul Brookes.
- Brown, B., Gough, P., and Roddis, J. (2004) *Types of research in the creative arts and design* [online]. University of Brighton, Faculty of Arts & Architecture [cited Accessed 17 2006].
<http://www.brighton.ac.uk/arts/research/5_0_scholarly_infrastructure/5_6_0_epapers/4_research.pdf>.
- Brown, D.M. (2006) *Communicating design: developing web site documentation for design and planning*. USA: New Riders.
- Brown, J.S., Collins, A. and Duguid, P. (1989) Situated cognition and the culture of learning. *Educational Researcher*, 18(1), pp32-42.
- Brown, P. and Levinson, S.C. (1987) *Politeness: Some universals in language usage*. New York: Cambridge University Press.
- Bryant, D. (2006) *The Uncanny Valley. Why are monster-movie zombies so horrifying and talking animals so fascinating?* [online]. [cited 13 October 2006].
<<http://www.arclight.net/~pdb/nonfiction/uncanny-valley.html>>.
- Burke, J.W. (1989) *Competency-based education and training*. London: Falmer Press.
- Cawsey, A. (no date) *History of instructional design and the roots of educational computing* [online]. Heriot-Watt University Edinburgh, Department of Computing and Electrical Engineering [cited 22 March 2001].
<<http://www.cee.hw.ac.uk/~alison/ctl/ctl96/HISTINST.html>>.
- Cazeaux, C. (1999) Theorizing theory and practice. *Point - Art and Design Research Journal*, Spring/Summer, 7 (Writing), pp26-31.

Chantler, P. and Harris, S. (1997) *Local radio journalism*. 2nd ed., Oxford: Focal Press.

Chen, I. (no date) *Cognitive constructivism* [online]. University of Colorado at Denver School of Education [cited 19 September 2001].
<<http://www.coe.uh.edu/~ichen/ebook/ET-IT/cognitiv.htm>>.

Chen, I. (no date) *Social constructivism*. [online]. University of Colorado at Denver School of Education [cited 19 September 2001].
<<http://www.coe.uh.edu/~ichen/ebook/ET-IT/social.htm>>.

Child, D. (1991) *Psychology and the teacher*. 4th ed., England: Cassell.

Clancey, W. J. (1995) A Tutorial on Situated Learning. In: Self, J (ed.) *Proceedings of the International Conference on Computers and Education (Taiwan)* [online].
Charlottesville, VA: AACE 49-71 1995. Institute for Research on Learning [cited 9 August 2003]. <<http://cogprints.ecs.soton.ac.uk/archive/00000323/00/139.htm>>.

Clark, D. (1995) *Instructional system development - evaluation phase - chapter vi* [online]. [cited 11 June 2006].
<<http://www.nwlink.com/~donclark/hrd/sat6.html>>.

Clark, D. (1999) *A time capsule of training and learning* [online]. [cited 2 June 1921].
<<http://www.nwlink.com/~donclark/hrd/history/history.html>>.

Clark, D. (2006) *Simulations and e-learning*. [online]. [cited 19 January 2008].
<http://www.epic.co.uk/content/resources/white_papers_download.htm?select edPapers=37>.

Clark, R. and Mayer, R. (2008) *e-Learning and the science of instruction*. 2nd ed., San Francisco: Pfeiffer.

Clayton, J. (1994) *Interviewing for journalists - How to research and conduct interviews you can sell*. London: Piatkus Publishing Ltd.

Clegg, S., Hudson, A. and Steel, J. (2003) The emperor's new clothes: globalisation and e-learning in higher education. *British Journal of Sociology of Education*, 24(1), pp.39-53.

Cohen, L., Manion, L. and Morrison, K. (2006) *Research methods in education*. 5th ed., USA: RoutledgeFalmer.

- Collis, B. and Strijker, A. (2004) Technology and human issues in reusing learning objects. *Journal of Interactive Media in Education*, 2004(4).
- Colvin, C. R. and Mayer, E. R. (2008) *E-learning and the science of instruction*. 2nd ed., USA: Pfeiffer.
- Comptroller and Auditor General. (2002a) *Widening participation in higher education in England - summary and recommendations*. HC 485, 2001-2002. London: The Stationery Office [Report].
- Comptroller and Auditor General. (2002b) *Improving student achievement in English higher education - summary and recommendations*. HC 486, 2001-2002. London: The Stationery Office [Report].
- Conner, M. (2001) *Learning from experience* [online]. [cited 24 October 2001]. <<http://www.learnativity.com/experience.html>>.
- Conole, G. (2002) Systematising learning and research information. *Journal of Interactive Media in Education*, 2002 (7).
- Conole, G. (2004) E-Learning: the hype and the reality. *Journal of Interactive Media in Education (Designing and Developing for the Disciplines Special Issue)*, 2004 (12).
- Conole, G. (2007) Describing learning activities. Tools and resources to guide practice. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge pp.81-91.
- Conole, G. and Fill, K. (2005) A learning design toolkit to create pedagogically effective learning activities. *Journal of Interactive Media in Education*, 2005 (08).
- Conole, G. and Oliver, M. (2002) Embedding theory into learning technology practice with toolkits. *Journal of Interactive Media in Education*, 2002(8).
- Conole, G. and Oliver, M. (2007a) *Contemporary perspectives in E-learning research. Themes, methods and impact on practice*. London: Routledge.
- Conole, G. and Oliver, M. (2007b) Introduction. In: Conole, G. and Oliver, M. (eds.) *Contemporary perspectives in e-learning research. Themes, methods and impact on practice*. London: Routledge, pp.3-20.

Conole, G., Oliver, M., Falconer, I., Littlejohn, A. and Harvey, J. (2007) Designing for learning. In: Conole, G. and Oliver, M. (eds.) *Contemporary perspectives in E-learning research. Themes, methods and impact on practice*. London: Routledge, pp.201-220.

Cook, J. (2002) The role of dialogue in computer-based learning and observing learning: an evolutionary approach to theory. *Journal of Interactive Media in Education*, 2002(5).

Cook, J., White, S., Sharples, M., Sclater, N., and Davis, H. (2007) The design of learning technologies. In: Conole, G. and Oliver, M. (eds.) *Contemporary perspectives in E-learning research. Themes, methods and impact on practice*. London: Routledge, pp.55-68.

Cooper, A. and Reimann, R. (2003) *About Face 2.0: The essentials of interaction design*. USA: Wiley Publishing.

Critchley, S. (2007) *All You Need to Know about Creativity, in 48 Pages*. [online]. [cited 03 March 2008]. <<http://blogs.oreilly.com/digitalmedia/2007/09/all-you-need-to-know-about-cre.html>>.

Crook, C. (1996) *Computers and the collaborative experience of learning*. London: Routledge.

Crystal, D. (1997) *The Cambridge encyclopaedia of language*. 2nd ed., Cambridge: Cambridge University Press.

Csikszentmihalyi, H. (1988) A theoretical model of optimal experience. In: Csikszentmihalyi, H. and Csikszentmihalyi, I. S. (eds.) *Optimal experience. Psychological studies of flow in consciousness*. UK: Cambridge University Press, pp.3-14.

Cunningham, I., Dawes, G. and Bennett, B. (2004) *The Handbook of Work Based Learning*. England: Gower Publishing Ltd.

Curzon, L.B. (1990) *Teaching in further education - An outline of principles and practice*. 4th ed., London: Cassell Educational.

Dallal, G.E. (2003) *Cause and effect* [online]. Tufts University USA [cited 8 March 2004]. <<http://www.tufts.edu/~gdallal/cause.htm>>.

Davies, A., (1997) *Assessment and transferable skills in art and design*. [online]. [cited

14 November 2007].

<http://www.city.londonmet.ac.uk/deliberations/Subjects/art_design/davies_re.html>.

Delmar College. (no date) *The cause and effect* [online]. The Writing Centre, Del Mar College [cited 8 March 2004].

<http://www.delmar.edu/engl/wrtctr/handouts/cause_effect.htm>.

Demar, G. (1999) *Behaviourism* [online]. [cited 19 September 2001].

<http://forerunner.com/forerunner/X0497_DeMar_-_Behaviorism.html>.

Department for Education and Employment. (1999) *The learning age - a renaissance for a new Britain* [online]. [cited 3 October 2003].

<<http://www.lifelonglearning.co.uk/greenpaper/>>.

Derrickson, R. (1996) *EVE* [CD-ROM]. UK: Real World Multimedia. Available as Mac OS7.1 and Windows 95 CD-ROM.

Dewey, J. (1958) *Art as experience*. New York: Capricorn Books.

DialogPLUS project. (2006) Software: description of the DialogPLUS toolkit.

[online]. University of Southampton [cited 20 January 2008].

<<http://www.dialogplus.soton.ac.uk/software.php>>.

Dick, B. (1999) *What is action research?* [online]. Southern Cross University, Australia [cited 17 August 2006].

<<http://www.scu.edu.au/schools/gcm/ar/whatisar.html>>.

Dick, B. (2005) *Grounded theory: a thumbnail sketch* [online]. [cited 17 August 2006].

<<http://www.scu.edu.au/schools/gcm/ar/arp/grounded.html>>.

Dillon, P. and Howe, T. (2007) An epistemology of presence and reconceptualisation in design education. *A Quarterly Review of Education*, 38(1), pp. 69-88.

Doherty, A., Mentkowski, M.M. and Conrad, K. (1978) Towards a theory of undergraduate learning. In: Keeton, M.T. and Tate, P.J. (eds.) *Learning by experience: what, why, how*. San Francisco: Jossey-Bass, pp.23-36.

Dormer, P. (1997) *The culture of craft*. UK: Manchester University Press.

Doughty, G. (1995) *TILT Group E - evaluation* [online]. University of Glasgow TILT Project [cited 17 September 2003].

<<http://www.elec.gla.ac.uk/TILT/E-Eval.html>>.

Douglas, N. (1995) *Customer service NVQ level 3* [CD-ROM]. UK: International Business Machines. Available as: Windows 3.1/95/98 CD-ROM.

Drew, L. and Williams, C. (2002) Variation in the experience of learning technologies in teaching in art, design, and communication: implications for networked dissemination strategies. In: Rust, C. (ed.) *Improving student learning using learning technology. Proceedings: 9th International Symposium*. Oxford: The Oxford Centre for Staff & Learning Development. pp.139-148.

Drew, L. (2003) *The experience of teaching in art and design communication*. Ph.D. Thesis, University of Lancaster.

Drew, L. (2007) Art, design and communication in higher education. *Art, Design and Communication in Higher Education*, 6(2) pp.113-115.

Duffy, T. M., and Kirkley, J. R. (2002) Learning theory and pedagogy applied in distance learning: the case of Cardean University. In: Duffy, T. M., and Kirkley, J. R. (eds.) *Learner centered theory and practice in distance education: cases from higher education*. Mahwah, NJ: Lawrence Erlbaum, pp.107-142.

Dunn, S. (2003) Return to SENDA? Implementing accessibility for disabled students in virtual learning environments in UK further and higher education. [online]. [cited 20 January 2008].

<<http://www.saradunn.net/VLEreport/index.html>>.

Dyke, M., Conole, G., Ravenscroft, A. and de Freitas, S. (2007) Learning theory and its application to e-learning. In: Conole, G. and Oliver, M. (eds.) *Contemporary perspectives in e-learning research. Themes, methods and impact on practice*. London: Routledge, pp.82-87.

Ecctis (no date) *Course discover* [online]. Department for Education and Skills [cited 20 February 2003]. <<http://www.ecctis.co.uk/>>.

Endsley, M.R. (2000a) Direct measurement of situation awareness: validity and use of SAGAT. In: Endsley, M.R. and Garland, D.J. (eds.) *Situation awareness analysis and measurement*. London: Lawrence Erlbaum Associates, pp.147-173.

- Endsley, M.R. (2000b) Preface. *In: Endsley, M.R. and Garland, D.J. (eds.) Situation awareness analysis and measurement*. London: Lawrence Erlbaum Associates, pp.xi-xv.
- Endsley, M.R. (2000c) Theoretical underpinnings of situation awareness: a critical review. *In: Endsley, M.R. and Garland, D.J. (eds.) Situation awareness analysis and measurement*. London: Lawrence Erlbaum Associates, pp.3-32.
- Endsley, M.R., Bolte, B. and Jones, D.G. (2003) *Designing for situation awareness - an approach to user-centred design*. London: Taylor and Francis.
- Endsley, M.R. and Garland, D. J. (2000) *Situation awareness analysis and measurement*. London: London: Lawrence Erlbaum Associates.
- Ericsson, K.A. (1996) *The road to excellence: acquisition of expert performance in the arts and sciences, sports and games*. USA: Lawrence Erlbaum Associates.
- Ericsson, K.A., Charness, N., Feltovich, P.J. and Hoffman, R.R. (2006) *The Cambridge handbook of expertise and expert performance*. UK: Cambridge University Press.
- Fairclough, N. (1989) *Language and power*. London: Longman.
- Farshad, F., Shaw, R., Fraser K., Dam, H.T., Hall, V., Hillier, P., Rowsell, D., and Gollifer, S. (2001) *Seeing Drawing* [CD-ROM]. UK: The London Institute, Available as Dual Platform Mac OS 9 and Microsoft Windows OS CD-ROM.
- Faulkner, L. (2003) Beyond the five-user assumption: benefits of increased sample sizes in usability testing. *Behavior Research Methods, Instruments & Computers*, 35(3), pp.379-383.
- Feinstein, A.H. and Cannon, H.M. (2002) Constructs of simulation evaluation. *Simulation and Gaming*, 33(4), pp.425-440.
- Ferrance, E. (2000) *Themes in education action research* [online]. Northeast and Islands Regional Educational Laboratory at Brown University [cited 21 August 2006]. <http://www.alliance.brown.edu/pubs/themes_ed/act_research.pdf>.
- Field, A. (2000) *Discovering statistics (using SPSS for Windows)*. London: Sage Publications.
- Fisher, G. (2006) The Learning and Teaching Environment in Art, Design and Media. [online]. [cited 17 November 2007]. <<http://www.adm.heacademy.ac.uk/library/files/events/enhancement-in->

scotland/fisher-keynote-learning-environments.pdf>.

Fleming, C. (2002) *Radio handbook*. 2nd ed., London: Routledge.

Focus Multimedia. (2003) *Artist!* [online]. Focus Multimedia [cited 14 October 2003].

<<http://www.focusmm.co.uk/store/productpages/productinfo/ess275.html>>.

Foster, J. (1996) *How to get ideas*. San Francisco: Berrett-Koehler.

Foster, J. (2007) *How to get ideas*. 2nd ed., San Francisco: Berrett-Koehler.

Fowler, T. and Mayes, T. (2004) *JISC e-learning models desk study. Stage 2: Mapping theory to practice and practice to tool functionality based on the Practitioners' perspective*. [online]. [cited 4th December 2007].

<<http://www.essex.ac.uk/chimera/projects/JISC/index.html>>.

Friesen, N. (2003) Three objections to learning objects and e-learning. In: Wiley, D. A. (ed.) *Online education using learning objects*. London: Routledge, pp.59-70.

Gabora, L. (2000) *The beer can theory of creativity* [online]. Centre Leo Apostel, Vrije Universiteit, Brussel [cited 10 December 2004].

<<http://www.vub.ac.be/CLEA/liane/PAPERS00/ces/beercan.htm>>.

Gage, N.L. and Berliner, D.C. (1998) *Educational psychology*. 6th ed., New York: Houghton Mifflin.

Gagne, R. (1985) *The conditions of learning and theory of instruction*. 4th ed., New York: Holt, Rinehart & Winston.

Gagnon Jr, G. W. and Collay, M. (1998) *Constructivist learning design* [online]. [cited 24 October 2001]. <<http://www.prainbow.com/cld/cldp.html>>.

Gamasutra, G. L. (2005) *Post-mortem: Myst IV - Revelation* [online]. [cited 13 October 2006]. <http://www.gamasutra.com/features/20050421/lord_pfv.htm>.

Gardner, M.R, Fowler, C. and Scott, J. (2003) A process of bridging technology and pedagogy for the design of e-learning systems. *Proceedings: Online Educa 7, Berlin, December 2003*.

Garrett, J.J. (2003) *The elements of user experience: user-centred design for the web*. USA: New Riders.

Garris, R., Ahlers, R. and Driskell, J.E. (2002) *Games, Motivation and learning: a*

research and practice model. *Simulation & Gaming*, 33(4), pp.441-467.

Garrison, D. R. and Vaughan, N. D. (2007) *Blended learning in higher education: framework, principles, and guidelines*. USA: Jossey-Bass.

Gibbons, A. S., Nelson, J. and Richards, R. (2002) The nature and origin of instructional objects. In: Wiley, D. A. (ed.) *The instructional use of learning objects*. USA: The Agency for Instructional Technology and the Association for Educational Communications and Technology, pp.1-58.

Gomoll, K. (1993) Some techniques for observing users. In: Laurel, B., (ed.) *The art of human computer interface design*. London: Addison-Wesley, pp. 85-90.

Goosen, K.R., Jensen, R. and Wells, R. (2001) Purpose and learning benefits of simulations: a design and development perspective. *Simulation & Gaming*, 32(1), pp.21-39.

Gopher, D., Weil, M. and Bareket, T. (1994) Transfer of skills from a computer game trainer to flight. *Human Factors*, 36(3), pp.387-405.

Goult, C. (2004) Implementing a virtual learning environment for art & design disciplines. ADM Subject Centre HE in FE Project Fund - End of Project Report. [online]. [cited 17 November 2007].
<<http://www.adm.heacademy.ac.uk/library/files/adm-hea-projects/cleveland.pdf>>.

Graddol, D. (1994) Three models of language description. In: Graddol, D. and Boyd-Barrett, O. (eds.) *Media texts: authors and readers*. Clevedon, England: Multilingual Matters / Open University, pp.1-21.

Gray, C. (1998) Inquiry through practice: developing appropriate research strategies. In *Proceedings: No Guru, No Method*. Conference, 1998, Research Institute, University of Art and Design, Helsinki.

Green, M., Odom, J.V. and Yates, J.T. (1998) *Measuring situation awareness with the "ideal observer"* [online]. Dept. of Ophthalmology, University of West Virginia Medial School AL/AOCOC. Brooks Air Force Base, Texas. ERGO/GERO Human Factors Science [cited 4 September 2003].
<<http://www.ergogero.com/sitaw/sitaware.html>>.

Greenaway, R. (2003) *Experiential learning cycles* [online]. [cited 9 February 2003].
<<http://reviewing.co.uk/research/learning/cycles.htm>>.

- Gery, G. (2003) *A Review of: Simulations and the future of learning: an innovative (and perhaps revolutionary) approach to e-learning* [online]. [cited 19 January 2008]. <http://findarticles.com/p/articles/mi_m0MNT/is_9_57/ai_107490426/pg_1>.
- Gustafsson, R. (2001) *Myst III Excile* [CD-ROM]. USA: Ubi Soft Entertainment and Presto Studios. Available as: Mac OS 8.1 and Windows 95/98/ME CD-ROM.
- Harding, B. and Ingraham, B. (2007) The art of design. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge, pp.142-152.
- Harper, D. (2003) *Sound recording and interview techniques*. Interviewed by: Davis, J. at domicile, Newcastle Under Lyme, 23 March.
- Harris, I. (2004) An eye for design. *MacFormat* (145) Future Publishing, UK, pp.22-25.
- Harvey, J. (1998) *Evaluation cookbook*. Scotland: Learning Technology Dissemination Initiative.
- Harward, J.M. (2003) *Animation math in lingo* [online]. [cited 15 March 2005]. <<http://www.jmckell.com/ideaswap.html>>.
- Hays, R.T. and Singer, M.J. (1989) *Simulation fidelity in training system design: bridging the gap between reality and training*. New York: Springer Verlag.
- Hayward, D. (2005) *Video games aesthetics: the future* [online]. [cited 13 October 2006]. <<http://modetwo.net/users/nachimir/vga/>>.
- Heller, S. and Anderson, G. (1991) *Graphic wit - the art of humour in design*. New York: Watson-Guptill Publications.
- Hermida, A. (2003) *Mobile gaming 'set to explode'* [online]. BBC [cited 22 September 2003]. <<http://news.bbc.co.uk/1/hi/technology/3182031.stm>>.
- Herr, K. and Anderson, G.L. (2005) *The action research dissertation - a guide for students and faculty*. USA: Sage Publications Ltd.
- Hill, W.F. (1997) *Learning - a survey of psychological interpretations*. 6th ed., Harlow: Longman.
- Hillier, R. (2007) *Sylexiad: a typeface for the adult dyslexic reader*. [online]. [cited 19 January 2008]. <<http://www.robsfonts.com/project.html>>

- Honey, P. and Mumford, A. (1986) *The manual of learning styles*. 2nd ed., Maidenhead: Peter Honey.
- Horton, W. (2006) So how is e-learning different? *In*: Kirkpatrick, D.L. and Kirkpatrick, J.D. (eds.) *Evaluating training programs - the four levels*, 3rd ed. USA: Berrett-Koehler, pp.95-113.
- Hudson, W. (2001) *How many users does it take to change a web site?* [online]. Syntagm [cited 10 February 2006].
<<http://www.syntagm.co.uk/design/articles/howmany.htm>>.
- Hughes, B. (2000) *Dust or magic - secrets of successful multimedia design*. London: Addison-Wesley.
- Hughes, J. and Attwell, G. (2002) *A framework for the evaluation of e-learning*. [online]. [cited 11 November 2006].
<http://www.theknownet.com/ict_smes_seminars/papers/Hughes_Attwell.html#H4_4>.
- Hummel, H.G.K., Paas, F. and Koper, R. (2006) Effects of cueing and collaboration on the acquisition of complex legal skills. *British Journal of Educational Psychology*, 76(3), pp.613–631.
- Hummel, J. (no date) *The behavioural system* [online]. [cited 19 September 2001].
<<http://www.valdosta.peachnet.edu/~whuitt/psy702/behsys/behsys.html>>.
- Immersion.Com. (no date) *CathSim - vascular access simulator* [online]. [cited 15 March 2003].
<http://www.immersion.com/medical/products/vascular_access/index.php>.
- Inglis, A., Ling, P. and Joosten, V. (1999) *Delivering digitally - managing the transition to the knowledge media*. London: Kogan Page.
- Islam, K. (2005) *Alternatives for measuring learning success* [online]. Learning and Training Innovations, Questrex Media [cited 11 November 2006].
<<http://www.ltimagazine.com/ltimagazine/article/articleDetail.jsp?id=85206>>.
- Issroff, K. and Scanlon, E. (2002) Educational technology: the influence of theory. *Journal of Interactive Media Education*, 2002(6).
- ITRDU. (no date) *Seeing Drawing: background information* [online]. London Institute (ITRDU) [cited 4 July 2003]. <<http://www.seeingdrawing.com/all.htm>>.

- Jackson, B. (1995) *Assessment practices in art and design: a contribution to student learning?* [online]. Middlesex University [cited October 2003].
<<http://www.lgu.ac.uk/deliberations/ocsd-pubs/islass-jackson.html>>.
- Jarvis, P. (1997) Learning practical knowledge. In: Kydd, L., Crawford, M. and Riches, C. (eds.) *Professional development for educational management*. UK: Open University Press, pp.26-36.
- Jermann, P. and Dillenbourg, P. (no date) *An analysis of learner arguments in a collective learning environment* [online]. In Proceedings: Computer Support for Collaborative Learning (CSCL) 1999 Conference, C. Hoadley & J. Roschelle (eds.) Dec. 12-15, Stanford University, Palo Alto, California. Mahwah, NJ: Lawrence Erlbaum Associates [cited 24 October 2001].
<<http://kn.cilt.org/csc199/A33/A33.HTM>>.
- JISC. (2007) *e-Learning frameworks and toolkits and demonstrations*. [online]. Joint Information Systems Committee. [cited 03 January 2008].
<http://www.jisc.ac.uk/whatwedo/programmes/elearning_framework/toolkit.aspx>.
- JISC. (2008) *e-Learning frameworks and tools programme*. [online]. Joint Information Systems Committee. [cited 03 January 2008].
<http://www.jisc.ac.uk/whatwedo/programmes/elearning_framework.aspx>.
- Jochems, W., Van Merriënboer, J., Koper, R. (2004) *Integrated E-learning. Implications for pedagogy, technology and organisation*. London: RoutledgeFalmer.
- Jonassen, D. (1998) Designing constructivist learning environments. In: Reigeluth, C. M. (ed.) *Instructional design theories and models, Vol. II*. Mahwah, NJ: Lawrence Erlbaum, pp.215-240.
- Jonassen, D., Mayes, T., and McAleese, R. (1993) *A manifesto of a constructivist approach to technology in higher education* [online]. [cited 19 September 2001].
<<http://cad017.gcal.ac.uk/clti/papers/TMPaper11.html>>.
- Johnson, P. (1992) *Human computer interaction psychology, task analysis and software engineering*. McGraw-Hill.
- Jones, C. (2004) Theory and the practices of learning technology. In: Lancaster University / University of Sheffield, *Networked Learning Conference, 5-7 April 2004*. UK: Lancaster University.

- Jones, C., Zenios, M. and Griffiths, J. (2004) *Academic use of digital resources: disciplinary differences and the issue of progression. Network Learning Conference - Symposium 9*. [online]. [cited 17 November 2007].
<http://www.networkedlearningconference.org.uk/past/nlc2004/proceedings/symposia/symposium9/jones_et_al.htm>.
- Jones, D.G. (2000) Subject measures of situation awareness. In: Endsley, M.R. and Garland, D.J., (eds.) *Situation awareness analysis and measurement*. London: Lawrence Erlbaum Associates, pp.113-128.
- Jones, R. and Boyle, T. (2007) Learning objects patterns for programming. *Interdisciplinary Journal of Knowledge and Learning Objects*. 3 (1), 19-28.
- Kamimura, Y. (2003) The power of experience. *Simulation & Gaming*, 33(4), pp.477-480.
- Keeton, M.T. and Associates. (1976) *Experiential learning - rationale, characteristics, and assessment*. London: Jossey-Bass.
- Keeton, M.T. and Tate, P.J. (1978) *Learning by experience: what, why, how*. London: Jossey-Bass.
- Kelly, C. (1997) *David Kolb: the theory of experiential learning and ESL*. [online]. Heian Jogakuin College (Osaka, Japan) [cited 24 October 2001].
<<http://www.aitech.ac.jp/~iteslj/Articles/Kelly-Experiential/>>.
- Kemp, J.E., Morrison, G.R. and Ross, S.M. (1998) *Designing effective instruction*. 2nd ed., New Jersey: Merrill.
- Kennedy, M., Petrovic, G., and Keppell, T. (1998) The development of multimedia evaluation criteria and a program of evaluation for computer-aided learning. In *Proceedings: ASCILITE 98 Flexibility: the next wave?* 14-16 December 1998. University of Wollongong, Australia, pp.407-415.
- Kent, S. (2001) *Comanche 4* [CD-ROM]. USA: Novologic. Available as: Windows 98/ME/2000/XP CD-ROM.
- Kingston, P. (2004) Online, off course - computers do not provide the motivation to learn. *Education Guardian*, Education edn, p.17, cols.1-5 [October 5, 2004] Guardian Newspaper.
- Kirkpatrick, D.L. and Kirkpatrick, J.D. (2006) *Evaluating training programs: the four*

- levels*. 3rd ed., USA: Berrett-Koehler.
- Klein, G. (2000) Analysis of situation awareness from critical incident reports. *In* Endsley, M.R. and Garland, D.J. (eds.) *Situation awareness analysis and measurement*. London: Lawrence Erlbaum Associates, pp.51-71.
- Kolb, D.A. (1984) *Experiential learning: experience as a source of learning and development*. New Jersey: Prentice-Hall.
- Kolko, J. (2007) *Thoughts on interaction design*. USA: BrownBear LLC.
- Koster, R. (2005) *A theory of fun for games design*. USA: Paraglyph Press Inc.
- Kruse, K. (no date) *Evaluating e-learning: introduction to the Kirkpatrick model* [online]. [cited 11 June 2006].
<http://www.e-learningguru.com/articles/art2_8.htm>.
- Kruse, K. (no date) *Gagne's nine events of instruction: an introduction* [online]. [cited 31 October 2006]. <http://www.e-learningguru.com/articles/art3_3.htm>.
- Kuniavsky, M. (2003) *Observing the user experience: a practitioners' guide to user research*. USA: Morgan Kaufmann Publishers.
- Kurosu, M. and Kashimura, K. (1995) Apparent usability vs. inherent usability: experimental analysis on the determinants of the apparent usability. *In*: Association for Computing Machinery (1995) *Computer-Human Interaction (CHI)*.
- Lackney, J. A. (1999) *A history of the studio-based learning model*. [online]. [cited 14 November 2007] <<http://schoolstudio.engr.wisc.edu/studiobasedlearning.html>>.
- Land, S.M. and Hannafin, M.J. (2000) Student centred learning environments. *In*: Jonassen, D.H. and Land, S.M. (eds.) *Theoretical foundations of learning environments*. New Jersey: Lawrence Erlbaum, pp.1- 24.
- Laurel, B. (1993a) *The art of human computer interface design*. London: Addison-Wesley.
- Laurel, B. (1993b) *Computers as theatre*. London: Addison-Wesley.
- Laurillard, D. (2002) *Rethinking university teaching: a framework for the effective use of learning technologies*. 2nd ed., London: Routledge Falmer.
- Lave, J. and Wenger, E. (1991) *Situated learning: legitimate peripheral participation*.

UK: Cambridge University Press.

Learnavity. (no date) *Learning simulations* [online]. Learnativity.com [cited 24 October 2001]. <<http://www.learnativity.com/simulations.html>>.

Learning Methods Unit. (1995) *Harnessing multimedia for education* [CD-ROM]. England: Liverpool John Moores University. Available as: Windows 98 CD-ROM.

Lidwell, W., Holden, K. and Butler, J. (2003) *Universal principles of design*. USA: Rockport Publishers.

Lieb, S. (1991) *Principles of adult learning* [online]. Vision, Fall [cited 24 October 2006].
<<http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/adults-2.htm>>.

Littlejohn, A., Cook, J., Campbell, L., Sclater, N., Currier, S. and Davis, H. (2007) Managing educational resources. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge pp.134-146.

Logan, C., Allan, S., Kurien, A. and Flint, D. (2007) *Distributed e-learning in Art, Design, Media: an investigation into current practice. Research commissioned by the Art Design Media Subject Centre – Higher Education Academy (ADM-HEA)*. [online]. [cited 17 November 2007]. <<http://www.adm.heacademy.ac.uk/projects/adm-hea-projects/distributed-e-learning-in-art-design-media>>.

Lou, Y. (2004) Developing complex problem-solving skills through between-group collaboration in online project-based courses. In *Proceedings: International Conference, 2004, Society for Information Technology and Teacher Education*, edited by C. Crawford, pp.4192-4194.

Lowe, J. and Davis, J. (1999) Training needs analysis. [CD-ROM]. UK: Centre for Rural Development and Training, University of Wolverhampton. Available as Microsoft Windows 98 CD-ROM.

Lyver, D. (1999) *Basics of video sound*. 2nd ed., Oxford: Focal Press.

Macaulay, D. (1996) *The way things work 2.0* [CD-ROM]. England: Dorling Kindersley. Available as Mac OS7.0 or later and Windows 95 CD-ROM.

- Macdonald, S. (1970) *The history and philosophy of art education*. UK: University of London Press.
- Machin, D. (2007) *Introduction to multimodal analysis*. London: Hodder Arnold.
- Madge, C. and Weinberger, B. (1973) *Art students observed*. London: Faber & Faber.
- Malins, J. (2006) *Project title: iSpace. Subtitle: Developing online resources for dyslexic students in Art and Design*. [online]. Grays School of Art, The Robert Gordon University [cited 19 January 2008]. <<http://adm.cogapp.com/library/files/adm-hea-projects/ispace-report.pdf>>
- Mason, R. (2004) *JISC e-learning models desk study. Stage 1: Pratt's five perspectives on effective practice*. [online]. [cited 4th December 2007]. <<http://www.essex.ac.uk/chimera/projects/JISC/index.html>>.
- Masterman, L. and Vogel, M. (2007) Practices and processes of design for learning. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge, pp.52-63.
- Mayes, T. (2004) *JISC e-learning models desk study. Stage 2: Learner-centred pedagogy: individual differences between learners*. [online]. [cited 4th December 2007]. <<http://www.essex.ac.uk/chimera/projects/JISC/index.html>>.
- Mayes, T. and de Freitas, S. (2004) *JISC e-Learning models desk study. Stage 2: Review of e-learning theories, frameworks and models*. [online]. [cited 4th December 2007]. <<http://www.essex.ac.uk/chimera/projects/JISC/index.html>>.
- Mayes, T. and de Freitas, S. (2007) Learning and e-learning: the role of theory. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge pp.12-25.
- McClundie, M. (2002) A guide to haptics applications in the digital realm. In: Newbury, D. and Stanley, N. (eds.) *Research issues in art, design and media*. Birmingham, UK: BIAD, UCE Birmingham.
- McKenna, S. E. (1999) *Theory and practice: revisiting critical pedagogy in studio art education* [online]. College Art Association [cited 11 June 2002]. <http://www.findarticles.com/cf_dls/m0425/1_58/54517188/p1/article.jhtml>.
- McNiff, J. and Whitehead, J. (2005) *Action research for teachers: a practical guide*. London: David Fulton Publishers Ltd.

- McTaggart, R. (2003) *The mission of the scholar in action research* [online]. James Cook University, Townsville, Queensland, Australia [cited 18 August 2006]. <<http://www.scu.edu.au/schools/gcm/ar/whyar.html>>.
- Metros, S.E. and Bennett, K. (2002) *Learning Objects in Higher Education - Research Bulletin Volume 2002 Issue 3*. [online]. EDUCASE Centre of Applied Research [cited 20 January 2008]. <<http://www.educause.edu/ir/library/pdf/ERB0219.pdf>>.
- Mergel, B. (1998) *Instructional design and learning theory* [online]. Graduate paper, Educational Communications and Technology, University of Saskatchewan [cited 24 October 2001]. <<http://www.usask.ca/education/coursework/802papers/mergel/brenda.htm>>.
- Miami Museum of Science. (2001) *Constructivism and the five E's* [online]. Miami Museum of Science [cited 24 October 2001]. <<http://www.miamisci.org/ph/lpintro5e.html>>.
- Microsoft. (1998) *Microsoft Combat Simulator WWII Europe Series* [CD-ROM]. Ireland: Microsoft. Available as: Windows 95/98/NT4 CD-ROM.
- Miller, G. A. (1956) *The magical number seven, plus or minus two: some limits on our capacity for processing information* [online]. [cited 17 October 2006]. <<http://www.well.com/user/smalin/miller.html>>.
- Miller, R. (1997) *Riven - the sequel to Myst* [CD-ROM]. England: Cyan / Broderbund Software. Available as: Mac OS 7.5 and Windows 95 CD-ROM.
- Miller, R. (2005) *Myst V end of ages* [CD-ROM]. France: Ubi Soft Entertainment. Available as: Mac OSX 2.8+ and Microsoft Windows XP CD-ROM.
- Mogey, N. (1998) *Evaluation studies*. Scotland: Learning Technology Dissemination Initiative.
- Mori, M. (1970) *The uncanny valley* [online]. [cited 13 October 2006]. <<http://www.androidscience.com/theuncannyvalley/proceedings2005/uncannyvalley.html>>.
- Nabeth, T. (no date) *Advances in education - simulation & games for education* [online]. The Centre for Advanced Learning Technologies (INSEAD) [cited 8 September 2004]. <<http://www.insead.fr/Encyclopedia/Education/Advances/games.html>>.

- NCTEAM. (2001a) *Drawing and learning* [online]. National Co-ordination Team (Working for the Higher Education Funding Council for England) [cited 17 September 2003].
<<http://www.ncteam.ac.uk/projects/tltp/tltp3/projectdescriptions/102.htm>>.
- NCTEAM. (2001b) *LiTMus: learning and teaching in music* [online]. National Co-ordination Team (working for the Higher Education Funding Council for England) [cited 17 September 2003]. <<http://www.ncteam.ac.uk/projects/fdtl/>>.
- Neill, J. (2003a) *500 word summary of John Dewey's "Experience & Education"*. [online]. [cited 9 January 2003].
<<http://www.wilderdom.com/experiential/SummaryJohnDeweyExperienceEducation.html>>.
- Neill, J. (2003b) *John Dewey, the modern father of experiential education* [online]. [cited 9 January 2003].
<<http://www.wilderdom.com/experiential/ExperientialDewey.html>>.
- Nelson, S. (1991) *Xplora 1 - Peter Gabriel's secret world* [CD-ROM]. UK: Realworld Multimedia. Available as: Mac OS 7 CD-ROM.
- Nicol, A. (1993) Interfaces for learning: what do teachers know that we don't? In: Laurel, B. (ed.) *The art of human computer interface design*. London: Addison-Wesley, pp.113-122.
- Nielsen, J. (2000) *Why you only need to test with 5 users*. [online]. [cited 10 February 2006]. <<http://www.useit.com/alertbox/20000319.html>>.
- Nielsen, J. (2001) *Success rate: the simplest usability metric* [online]. [cited 10 February 2006]. <<http://www.useit.com/alertbox/20010218.html>>.
- Norman, D.A. (2000) *The design of everyday things*. 3rd ed., London: MIT Press.
- Norman, D.A. (2002) Emotion and design: attractive things work better. *Interactions Magazine*, ix(4), pp.36-42.
- Norman, D.A. (2004) *Emotional design: why we love or hate everyday things*. New York: Basic Books.
- Norris, S. (2004) *Analyzing multimodal interaction: a methodological framework*. UK: Routledge.

- Oasis Blue Productions. (1999) *Easy Drums* [CD-ROM]. Toronto, Canada: Arc Media. Available as: Dual platform Mac System 7 and Windows 3.1/NT/95/98 CD-ROM.
- Oliver, M. (2002a) Special issue on theory for learning technologies: Editorial. *Journal of Interactive Media in Education*, 2002(9), pp.1-2.
- Oliver, M. (2002b) What do learning technologists do? *Innovations in Education and Teaching International*, 39(4), pp.245-252.
- Oliver, M. (2004) JISC e-learning models desk study. Stage 2: Assessing the relevance of the review of e-learning theories, frameworks and models and the mapping table to evaluators. [online]. [cited 4th December 2007]. <<http://www.essex.ac.uk/chimera/projects/JISC/index.html>>.
- Oliver, M., Gunn, C., Beetham, H., Boyle, T., Conole, G. and Ingraham, B. (2001) No blue skies without firm foundations: developing theory of learning technology. *In Proceedings: 8th International Conference, ALT-C 2001 Changing Learning Environments*, Association of Learning Technology, edited by C. Gunn. Oxford, UK: Information Press.
- Oliver, M., Roberts, G., Beetham, H., Ingraham, B., Dyke, M. and Levy, P. (2007) Knowledge, society and perspectives on learning technology. *In: Conole, G. and Oliver, M. (eds.) Contemporary perspectives in e-learning research. Themes, methods and impact on practice*. London: Routledge, pp.21-37.
- OLTC. (1996) *Learning with software - pedagogies and practice* [online]. Open Learning Technology Corporation [cited 9 August 2003]. <<http://www.educationau.edu.au/archives/CP/default.htm>>.
- O'Reilly, T. (2004) Open source paradigm shift [online]. [cited 23 February 2008]. <http://tim.oreilly.com/articles/paradigmshift_0504.html>.
- Osterweil, S. and Hancock, C. (1996) *Zoombinis maths journey* [CD-ROM]. UK: Broderbund Software. Available as: Mac OS 7.01 and Windows 3.1/95 CD-ROM.
- Oud, J. (2004) 'A technique for producing ideas' by James Webb Young. [online]. [cited 20 January 2008]. <<http://www.marketing-planet.com/articles/technique-for-producing-ideas-by-james-webb-young-34.html>>.

- Oviatt, S. (1999) Moving from traditional interfaces toward interfaces offering users greater expressive power, naturalness, and portability. Ten myths of multimodal interaction. *Communications of the ACM*. 42 (11), 74-81.
- Oxford Centre for Staff and Learning Development. (2001) Proceedings: 9th Improving Student Learning symposium, held in 2001 in Edinburgh. *Improving student learning: Improving student learning using learning technology*. Edited by Chris Rust. UK: OCSLD.
- Palloff, R.M. and Pratt, K. (1999) *Building learning communities in cyberspace: effective strategies for the on-line classroom*. San Francisco: Jossey-Bass.
- Parkinson, S.E. and Edwards, J.H. (no date) *Innovative visual-spatial powers in dyslexics: a new perspective?* [online]. The Art Dyslexia Trust [cited 4 March 2001]. <<http://www.rmplc.co.uk/orgs/nellalex/adtvissuospacial.html>>.
- Partick Fortier. (2004) *Myst IV Revelation* [CD-ROM]. France: Ubi Soft Entertainment. Available as: Mac OSX 10.2 + and Windows 98SE/2000/ME/XP CD-ROM.
- Paxton, R. J. (2002) Students' use of learning objects. *Cognition and Instruction*. 20 (2), 197-248.
- Peacock, D. (2002) *Further Learning Yes! - DNER Development project Plan Project Plan*. [online]. [cited 17 November 2007]. <<http://www.e-studio.ac.uk/WordDocs/E-Studio%20Project%20Report.doc>>.
- Peacock, D. and Andrews, B. (2004) Design, engagabilty and cultural change: an e-studio perspective. First published in the *Proceedings of the 1st Design and Engagability Conference (IDEC)* July 6th 2004 Birmingham Institute of Art and Design, University of Central England. [online]. [cited 17 November 2007]. <<http://www.x4l.org/resources/estudio/DesignEngagability.doc>>.
- Perfetti, C. (2001) *Personas: matching a design to the user's goals* [online]. User Interface Engineering [cited 8 August 2006]. <<http://www.uie.com/articles/personas/>>.
- Pew, R.W. (2000) The state of situation awareness measurement: heading towards the next century. In: Endsley, M.R. and Garland, D.J. (eds.) *Situation awareness analysis and measurement*. London: Lawrence Erlbaum Associates, pp.33-47.
- Phillips, J. (2005) *Down in the valley: the uncanny valley of Doctor Mori, or why*

animated characters don't always look like real people, and shouldn't [online]. [cited 13 October 2006]. <<http://www.biganimation.com/magazine/news/article-feature.asp?articleid=483&zzoneid=3&pos=1>>.

Phillips, R. (2002) *Approaches to evaluating the effect of ICT on student learning* [online]. HEA, Higher Education Academy [cited 11 November 2006]. <http://www.heacademy.ac.uk/resources.asp?process=full_record§ion=generic&id=172>.

Poggenpohl, S. H., (1993) *What goes on in design school?* [online]. [cited 14 November 2007]. <<http://www.aiga.org/content.cfm/guide-whatgoeson>>.

Preece, J., Rogers, Y. and Sharp, H. (2002) *Interaction design: beyond human computer interaction*. USA: Wiley & Sons.

Pritchett, A.R., Hansman, R.J. and Johnson, E.N. (1996) *Use of testable responses for performance-based measurement of situation awareness* [online]. Presented at the international conference on experimental analysis and measurement of situation awareness, BEACH, FL, November 1996. Department of Aeronautics & Astronautics Institute of Technology [cited 4 September 2003]. <<http://web.mit.edu/aeroastro/www/labs/ASL/SA/sa.html>>.

Prytherch, D. (2002) So what is haptics anyway? Weber, Katz and beyond: an introduction to psychological studies of touch and the implications for an understanding of artists' making and thinking processes. In: Newbury, D. and Stanley, N. (eds.) *Research issues in art, design and media*. Birmingham, UK: BIAD, UCE Birmingham.

Quality Assurance Agency for Higher Education. (2002) *Benchmarking academic standards* [online]. Quality Assurance Agency for Higher Education. [cited 3 October 2003]. <<http://www.qaa.ac.uk/crntwork/benchmark/phase2/artanddesign.pdf>>.

Quality Assurance Agency. (2007) *Subject benchmark statement. Art and design, and history of art architecture and design. Draft for consultation September 2007*. [online]. [cited 30th November 2007]. <<http://www.qaa.ac.uk/academicinfrastructure/benchmark/statements/drafts/ADHAAD.asp>>.

Race, P. (1999) *2000 tips for lecturers*. London: Kogan Page.

- Raj, A. (no date) *Tactile situation awareness systems* [online]. University of West Florida, Institute of Human Machine and Cognition [cited 19 April 2003]. <<http://www.coginst.uwf.edu/projects/tsas/description.html>>.
- Ravenscroft, A. (2003a) Round Table Discussion : *Beyond Theory Conference 2003 - Educational best practice and the use of ICT for teaching and learning*. [online]. The Oxford Union Debating Chamber. [cited 13 November 2007]. <<http://www.oucs.ox.ac.uk/ltg/events/beyondnew/transcripts.html>>.
- Ravenscroft, A. (2003b) From conditioning to learning communities: implications of fifty years of research in e-learning interaction design. *ALT J*, 11(3), pp.4-18.
- Ravenscroft A and Cook, J. (2007) New Horizons in Learning Design. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning*. London: Routledge, pp.207- 218.
- Remedy Entertainment / Apogee Software. (2001) *Max Payne* [CD-ROM]. UK: Gathering of Developers and Take Two Interactive Software. Available as: Windows 98/XP CD-ROM.
- Rheingold, H. (1993) An interview with Don Norman. In: Laurel, B. (ed.) *The art of human computer interface design*. London: Addison-Wesley, pp.5-10.
- Riches, C. (1997) Motivation in education. In: Kydd, L., Crawford, M. and Riches, C. (eds.) *Professional development for educational management*. UK: Open University Press, pp. 88-102.
- Richmond, S. (1991) Three Assumptions that Influence Art Education: A Description and a Critique. *Journal of Aesthetic Education*, 25(2), pp. 1-15.
- RLO-CETL. (2005) FAQs *What is a reusable learning Object*. [online]. Centre for Excellence in Teaching and Learning in Reusable Learning Objects [cited 20 January 2008]. <<http://www.rlo-cetl.ac.uk/faqs.htm>>.
- Roberts, G. and Huggins, R. (2004) *Pedagogical Pragmatism: A New Critical Approach to the Development of Resources for Learning*. [online]. Networked Learning Conference 2004. [cited 29 December 2007]. <http://www.networkedlearningconference.org.uk/past/nlc2004/proceedings/individual_papers/roberts_huggins.htm>.

Roberts, S. (2006) *Details about project 102 Drawing and Learning aka Seeing Drawing* [email]. Message to Jim Davis. Stored on Jim Davis's home email system. Personal communication.

Rothacker, D. (2007) *A technique for producing ideas*. [online]. [cited 03 March 2008]. <<http://blogs.oreilly.com/digitalmedia/2007/09/all-you-need-to-know-about-cre.html>>.

Ruben, B.D. (1999) Simulations, games, and experience-based learning: the quest for a new paradigm for teaching and learning. *Simulation & Gaming*, 30(4), pp.498-505.

Ryder, M. (no date) *Constructivism* [online]. University of Colorado at Denver School of Education [cited 13 March 2001]. <<http://carbon.cudenver.edu/~mryder/itc/constructivism.html>>.

Sagan, O. (2007) *Research into Pedagogy in Art and Design in Further and Higher Education* [Email]. Message to Jim Davis. Stored on Jim Davis's Home Email system. Personal Communication.

Salen, K. and Zimmerman, E. (2004) *Rules of play: game design fundamentals*. USA: MIT Press.

Schlusmans, K., Koper, R. and Giesbertz, W. (2004) Work processes for the development of integrated e-learning courses. In: Jochems, W., Van Merriënboer, J. and Koper, R. (eds.) *Integrated e-learning. Implications for pedagogy, technology and organisation*. London: RoutledgeFalmer, pp. 126-138.

Schmucker, K. (1999) A taxonomy of simulation software. *Learning Technology Review, Spring/Summer 1999* [online]. Apple Computer [cited 8 September 2004]. <<http://www.apple.com/education/LTReview/spring99/simulation/>>.

Schon, D. (1987a) *Educating the reflective practitioner - toward a new design for teaching and learning in the professions*. UK: Jossey Bass.

Schon, D. (1987b) *Educating the reflective practitioner - presentation to the AERA meeting 1987* [online]. American Educational Research Association [cited 14 November 2001]. <<http://hci.stanford.edu/other/schon87.htm>>.

Scott, J. (2004) *JISC e-learning models desk study. Stage 2: Assessing the relevance of the review of e-learning theories, frameworks and models and the mapping table to designers.* [online]. [cited 4th December 2007].

<<http://www.essex.ac.uk/chimera/projects/JISC/index.html>>.

Scottish Funding Council. (2006) *Implementing e-learning.* [online]. [cited 20 January 2008]. <<http://www.jiscinfonet.ac.uk/InfoKits/implementing-elearning>>.

Seale, J., Boyle, T., Ingraham, B., Roberts, G. and McAvinia, C. (2007) Designing digital resources for learning. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning.* London: Routledge pp.121-133.

SED. (1995) *Building an understanding of constructivism* [online]. Southwest Educational Development Laboratory [cited 19 September 2001].

<<http://www.sedl.org/scimath/compass/v01n03/understand.html>>.

Seels, B. and Glasgow, Z. (1998) *Making instructional design decisions.* 2nd ed., New Jersey: Merrill.

Sensible Technologies (no date) *Phantom* [online]. [cited 15 October 2003].

<http://www.sensible.com/products/phantom_ghost/phantom.asp>.

Sharpe, R. and Oliver, M. (2007) Designing courses for e-learning. In: Beetham, H. and Sharpe, R. (eds.) *Rethinking pedagogy for a digital age designing and delivering e-learning.* London: Routledge pp.41-51.

Sherwood, C. and Rout, T. (1998) A structured methodology for multimedia product and systems development. In *Proceedings: ASCILITE 98 Flexibility: the next wave?* 14-16 December 1998, University of Wollongong Australia, pp.617-625.

Shirley, K. (1997) *Aerosmith - Nine Lives Audio Title with CD Extra* [CD-ROM]. UK: Sony Music Entertainment. Available as: Mac OS 7.1 and Windows 3.1 CD-ROM.

Shrensky, R. and Sless, D. (2005) *Choosing the right method for testing* [online]. CRIA - Communication Research Institute [cited 8 April 2005].

<http://communication.org.au/cria_publications/publication_id_94_2114333509.html>.

Shubik, M. (1998) Gaming - theory and practice, past and future. *Simulation and Gaming*, 20(2), pp184-189.

- Silverman, D. (2001) *Interpreting qualitative data - methods of analysing talk, text and interaction*. 2nd ed., UK: Sage Publications.
- Sims, E. (2006) *Designs on e-learning*. International Conference on Teaching and Learning with Technology in Art, Design and Communication. Association for Learning technology On-Line Newsletter Issue 3, January 2006. [online]. [cited 17 November 2007].
<http://newsletter.alt.ac.uk/e_article000503156.cfm?x=b11,0,w>.
- Skinner, B.F. (1974) *About behaviourism*. New York, NY: Alfred A. Knopf.
- Sky TV. (2004) *Super structures: Boeing 747* [TV broadcast]. Producer Anne Erickson UK, Screaming Flea Productions for Discovery Communications. (Aired 20 September 2004 on Sky Discovery Channel, length: 56 minutes.)
- Smith, M. K. (1996) *Action research* [online]. INFED, the encyclopaedia of informal education [cited 17 August 2006]. <<http://www.infed.org/research/b-actres.htm>>.
- Smith, M. K. (2001a) *Donald Schön: learning, reflection and change* [online]. The encyclopaedia of informal education [cited 17 August 2006].
<<http://www.infed.org/thinkers/et-schon.htm>>.
- Smith, M. K. (2001b) *Kurt Lewin, groups, experiential learning and action research* [online]. The Encyclopaedia of Informal Education [cited 17 August 2006].
<<http://www.infed.org/thinkers/et-lewin.htm>>.
- Smith, P.L. and Ragan, T.J. (1999) *Instructional design*. 2nd ed., New Jersey: Merrill.
- Smythe, J.L. (2002) When simulations do not go as planned: a designer's perspective. *Simulation & Games*, 33(4), pp.473-476.
- Snyder, C. (2003) *Paper prototyping: the fast and easy way to design and refine user interfaces*. USA: Morgan Kaufmann Publishing.
- Social Informatics Research Unit. (2005) *Study of MLE activity. JISC funding programme - MLEs for lifelong learning: building MLEs across HE and FE* [online]. [cited 17 November 2007].
<http://www.jisc.ac.uk/whatwedo/programmes/programme_buildmle_hefe/project_mle_activity.aspx>.

- Sonnenschein, D. (2001) *Sound design: the expressive power of music, voice and sound effects in cinema*. California: Michael Wiese Productions.
- Souleles, N. (2005) *E-learning in art and design: perceptions and practices of teachers in undergraduate studio-based disciplines*. [online]. [cited 13 November 2007].
<<http://www.elearningartdesign.org/researc.htm>>.
- Sparke, P. (1987) *Design in context*. London: Quarto Publishing.
- Spool, J. and Schroeder, W. (2001) Testing web sites: five users is nowhere near enough. In: *ACM CHI Conference on Human Factors in Computing Systems, 2001*. Seattle, WA. USA.
- Stein, A. (1995) *PAWS (personal automated wagging system) dog simulator* [CD-ROM]. USA: Domestic Funk Productions / Virgin Records America. Available as: Mac OS 7 and Windows 3.1/95 CD-ROM.
- Stephenson, J. (2001) *Teaching and learning on-line - pedagogies for new technologies*. London: Kogan Page.
- Stoner, G. (1996) *Implementing learning technology*. Scotland: Learning Technology Dissemination Initiative.
- Strand, L. (1993) *Myst* [CD-ROM]. England: Cyan / Broderbund Software. Available as: Mac OS 7.1 CD-ROM.
- Swan, C. (2002) Nellie is Dead. *Art, Design and Communication in Higher Education*, 1(1), pp.51-54.
- Swann, A. (1990) *Design and marketing*. Oxford: Phaidon Press.
- Swepson, P. (1998) Separating the ideals of research from the methodology of research, either action research or science, can lead to better research [online]. *Action Research International*, Paper 1.
<<http://www.scu.edu.au/schools/gcm/ar/ari/p-pswepson98.html>>.
- Talbot-Smith, M. (1997) *Audio explained*. Oxford: Focal Press.
- Tanesy, P.J. and Unwin, D. (1969) *Simulation and gaming in education*. London: Methuen Educational.

- Taylor-Powell, E. and Renner, M. (2003) *Analyzing qualitative data* [online]. University of Wisconsin, Cooperative Extension, Madison, Wisconsin [cited 19 September 2005]. <http://learningstore.uwex.edu/pdf/G3658_12.PDF>.
- Thompson, C. (2004) *The undead zone: why realistic graphics make humans look creepy* [online]. [cited 13 October 2006]. <<http://www.slate.com/id/2102086/>>.
- Thompson, C. (2005) *Monsters of photorealism* [online]. [cited 13 October 2006]. <<http://www.wired.com/news/culture/0,69739-0.html>>.
- Tidwell, J. (2006) *Designing interfaces: patterns for effective interaction design*. 1st ed., USA: O'Reilly Media.
- TLTP. (2001) *Teaching and Learning Technology Programme (TLTP)* [online]. Higher Education Funding Council for England [cited 7 September 2003]. <<http://www.hefce.ac.uk/learning/tinits/tltp/>>.
- Toby Gard (1996) *Tomb Raider* [CD-ROM]. UK: Core Design (Eidos Interactive). Available as: Sony PlayStation CD-ROM.
- Tompkins, P.K. (1998) *Role-playing / simulation* [online]. The Internet TESL Journal, IV(8) (August 1998), [cited 8 September 2004]. <<http://iteslj.org/Techniques/Tompkins-RolePlaying.html>>.
- UBI Soft Entertainment. (2003) *Artist!* [CD-ROM]. UK: Focus Multimedia. Available as: Windows 95/98/ME/XP CD-ROM.
- University of Wolverhampton. (no date) *Information and communication technology school strategic plan* [online]. University of Wolverhampton, School of Art and Design [cited 11 August 2002]. <http://www.wlv.ac.uk/celt/documents/sad_tsl_strategy.doc>.
- University of Wolverhampton. (2000a) *Strategy for learning and teaching* [online]. University of Wolverhampton [cited 11 August 2002]. <http://www.wlv.ac.uk/celt/documents/UW_Strategy_for_Learning_and_Teaching.doc>.
- University of Wolverhampton. (2000b) *Strategy for learning and teaching*. [online]. University of Wolverhampton [cited 12 November 2002]. <<http://asp.wlv.ac.uk/Level3.asp?UserType=11&Level3=516>>.
- Vaughan, T. (1993) *Multimedia: making it work*. London: McGraw-Hill.

- Velthoven, W. (2003) *Doors of Perception CDROM* [email]. Message to Jim Davis. Stored on Jim Davis's home email system. Personal communication.
- Velthoven, W. (1994) *Doors of Perception 1* [CD-ROM]. Netherlands: The Netherlands Design Institute (Vormgevingsintituut). Available as: Mac OS 7 CD-ROM.
- Vygotsky, L.S. (1994) Extracts from *Thoughts and Language* and *Mind and Society*. In: Stierer, B. and Maybin, J. (eds.) *Language, literacy and learning in educational practice*. Clevedon, England: Multilingual Matters (Open University), pp. 45-58.
- Waters, M. (2005) *Schon and reflective Practice*. [online]. [cited 5 November 2007]. <<http://www.resources.scalingtheheights.com/Schon%20and%20Reflective%20Practice.htm>>.
- Watts, H. (1996) *On camera: how to produce film and video*. UK: BBC Consumer Publishing (Books).
- Weil, S.W. and McGill, I. (1989) *Making sense of experiential learning: diversity in theory and practice*. Milton Keynes: Open University Press.
- Whiteley, T.R. and Faria, A.J. (1998) A study of the relationship between student final exam performance and simulation game participation. *Simulation & Games*, 20(1), pp.44-64.
- Wickens, C.D. (2000) The trade-off of design of routine and unexpected performance: implications of situation awareness. In: Endsley, M.R. and Garland, D.J. (eds.) *Situation awareness analysis and measurement*. USA: Lawrence Erlbaum Associates, pp.211-225.
- Wiley, D. A. (2000) *Learning object design and sequencing theory*. Ph.D. Thesis, Brigham Young University.
- Wiley, D. A. (2002) Connecting learning objects to instructional design theory: A definition, a metaphor, and a taxonomy. In: Wiley, D. A. (ed) *The instructional use of learning objects*. USA: The Agency for Instructional Technology and the Association for Educational Communications and Technology, pp.1-35.
- Williams, R. (1994) *The non-designer's design book: design and typographic principles for the visual novice*. Berkeley, California: Peachpit Press.

Wilson, B., Jonassen, D. and Cole, P. (1993) Cognitive approaches to instructional design. In: Piskurich, G.M., (ed.) *The ASTD handbook of instructional technology*. New York: McGraw-Hill, pp.21.1-22.22.

Wilson, B. (1999) *The dangers of a theory-based design*. [online]. [cited 17 November 2007]. <<http://carbon.cudenver.edu/~bwilson/dangers.htm>>.

Wolff, U. (2002) *Dyslexia - myths and realities - the prevalence of dyslexia among art students* [online]. Institutionen för pedagogik och didaktik [cited 12 November 2002]. <<http://www.ped.gu.se/forskarutbildning/U.Wolff.pdf>>.

Woods, J. (2004) Open minds and a sense of adventure: how teachers in art and design approach technology. *International Journal of Art and Design Education*, 23(2), pp.179-191.

Woods, R. (2004) Simulation tools can help publishers to avoid flying in the dark. *newspaper techniques*, February, 2004, Ifra, pp.10-13.

Wright, W. and Haslam, F. (1989) SimCity [3.5 inch floppy disk]. UK: Maxis, Broderbund. Available for Apple Macintosh OS v6.

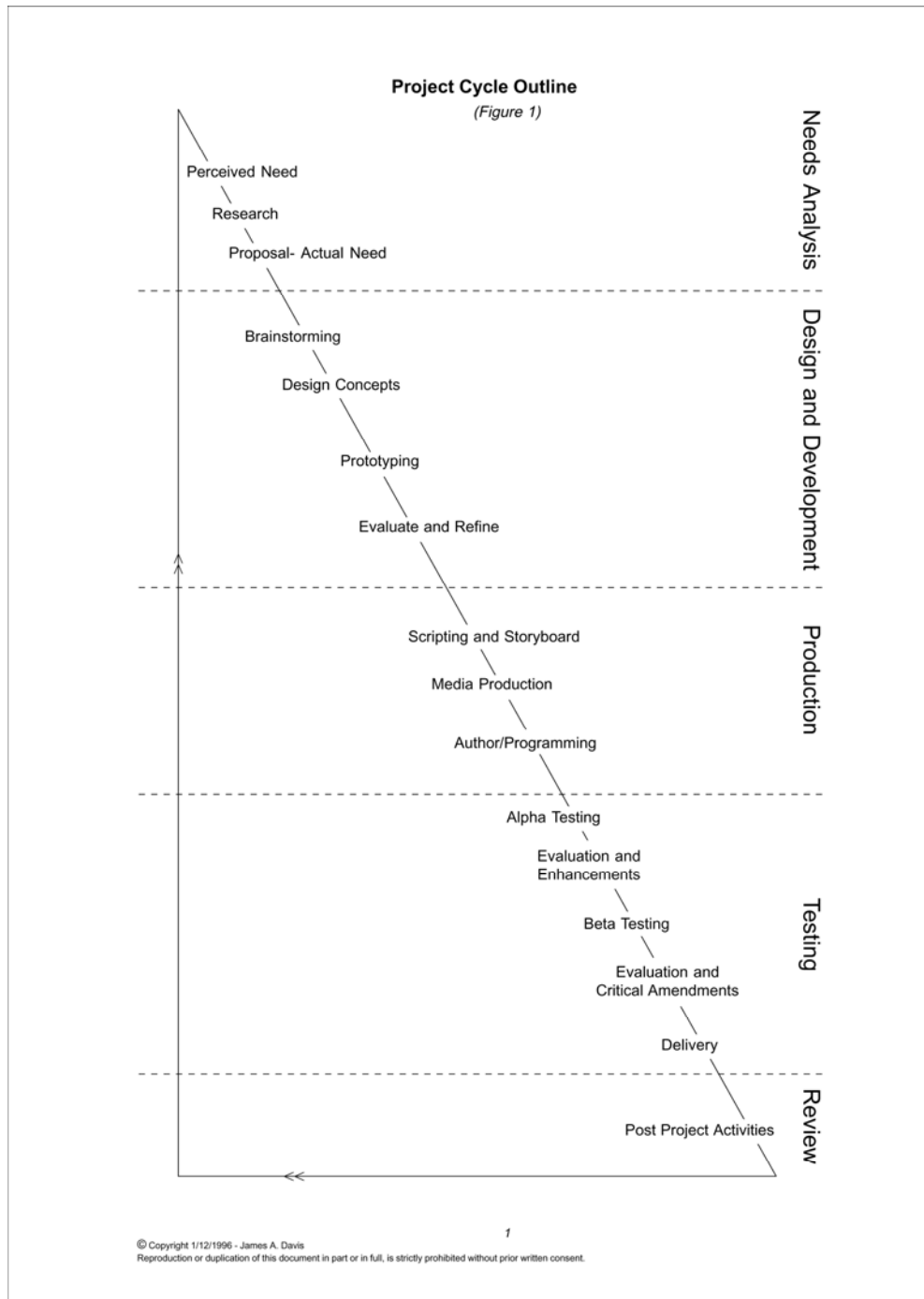
Young, J.W. (1975) *A technique for producing ideas*. USA: NTC Business Books.

Supporting creative work

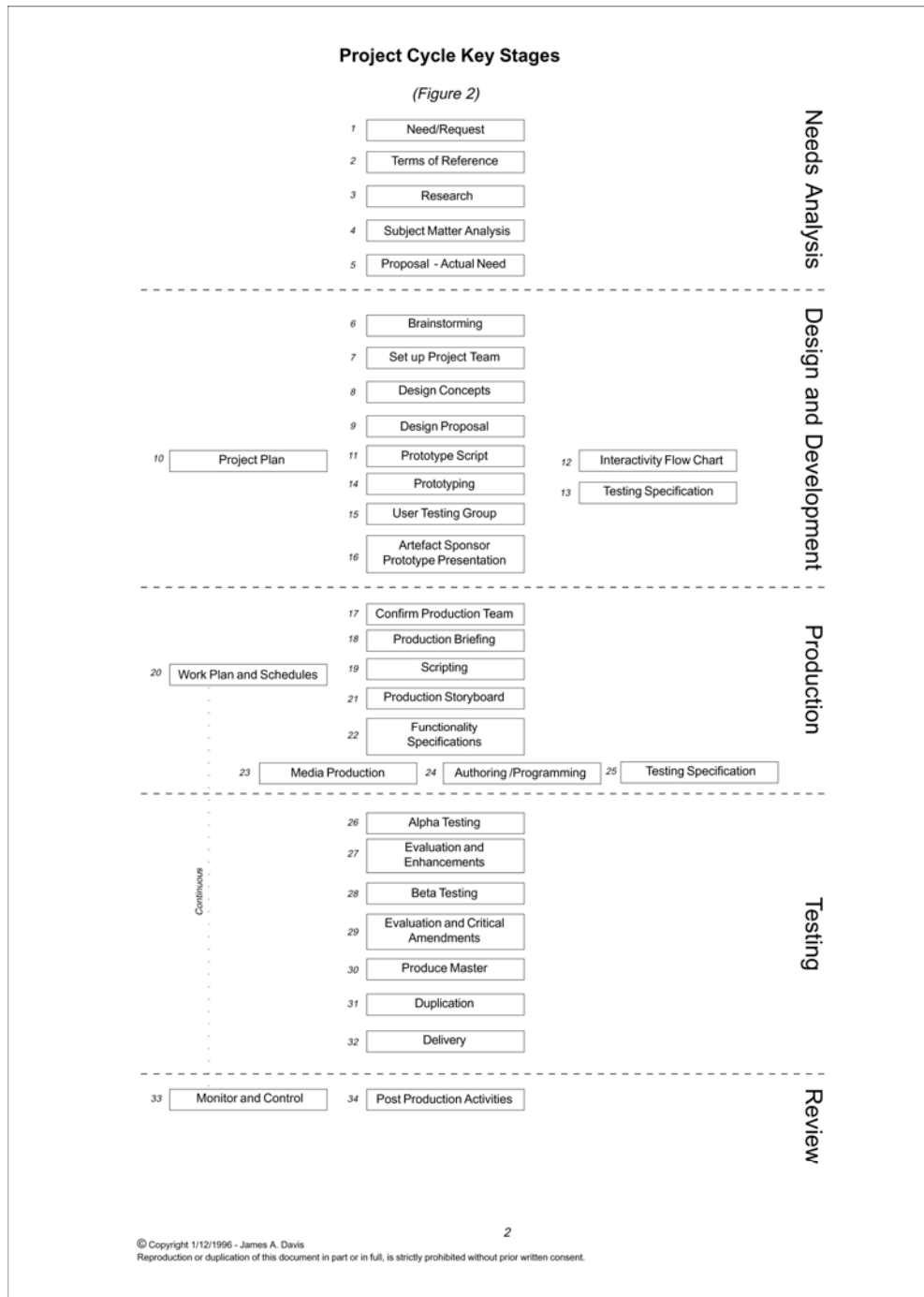
This aspect of this document contains the learning technology artefact RecordingCoach and includes the media and documents supporting its conception development and production. These are organised in to 'elements' here and are referred to as 'elements' for example, 'element 1' within the main body of the accompanying thesis.

Element 1 - TSL artefact outline project cycle and skills audit

Part 1 of 8



Part 2 of 8



Part 3 of 8

Tasks / Key Stages Definition*(Figure 3)***Needs Analysis**

1. **Need/Request** - Perceived / Actual Need
2. **Terms of Reference** - Course sponsors perceived problem / what will be researched / what the research consists of and why / agree who to see.
3. **Research** - Content / using Subject Matter Experts (S.M.E.), detailing work with client, looking at existing internal and external material.
4. **Subject Matter Analysis** - Agreeing content of subject matter with client and defining objectives (outcomes), framework.
5. **Proposal** - Evaluation criteria, conclusion of the research, recommendations of media used (e.g. screen or text book etc.), evidence of other options explored. Maintenance proposal.

Design and Development

6. **Brainstorming** - to include all potential development team members
7. **Set up Project Team** - specific team members allocated to project
8. **Design Concepts** - (project team), paper or screen visuals, storyboarding ideas including, interface, metaphor, behavioural characteristics, functionality and media elements.
9. **Design Proposal** - One idea submitted with objectives, description, structure outline, example screens/interface and estimated budget/time scales.
10. **Project Plan** - Listing team roles and responsibilities. Detailing 'mile stones' (key stages) and time scales. Contract Clause (job amendments).
11. **Prototype Script** - Areas of script which need to be evaluated, chunks of example text/dialogue.
12. **Interactive Flow Chart** - Proposed screens and interactive elements (buttons etc.) plotting the structure/ detailing where they branch to.
13. **Testing Specification (for prototype)** - A full test plan for prototype testing identifying the full range of elements under evaluation e.g. functionality, navigation, illustrations, clarity of instructions etc.

14. **Prototyping** - Flavour of the proposed product/ structure, navigation, script, interface, metaphors, behavioural characteristics.

15. **User Testing Group** - A group of people drawn together from a cross section of the intended users. The group will be consistent, where possible, throughout the various testing stages including prototype and alpha testing.

16. **Artefact Sponsor Prototype Presentation** - Sponsor agree prototype, with reference to design proposal.

Production

17. **Confirm Production Team** - In relation to expertise identified/clarified during preceding activities (e.g. Programme/author skills and tools).
18. **Production Briefing** - Agenda meetings covering a variety of aspects of the production, including change control/version control/directory and file names/test plan, technical specification/how often the team will meet etc.
19. **Scripting** - Text (words on the screen) audio narrative and dialogue/video narrative and dialogue.
- 20a. **Work Plan** - Using the 'milestone' (key stage) plan, identify all tasks required to complete each 'milestone' (key stage) and build into a work plan. The work plan is used for effective resource management to avoid delays and gaps during the project.
- 20b. **Schedules** - At this stage team members can set realistic time scales for tasks so that deadlines can be set in the work plan. (Calendar type schedules).
21. **Production Storyboard** - Production team outline each of the proposed screens showing/describing all media elements.
22. **Functionality Specification** - A description of the functionality of each screen.
23. **Media Production** - Production of text, sound, video, animation, graphics etc.
24. **Authoring /Programming** - Build and put all the elements together

3

© Copyright 1/12/1996 - James A. Davis
Reproduction or duplication of this document in part or in full, is strictly prohibited without prior written consent.

Part 4 of 8

Task / Key Stages Definition (cont'd)
(Figure 3)

25. Testing Specification - A full test plan is undertaken in the first instance for Alpha testing and in the second instance Beta testing, identifying the full range of elements under evaluation e.g. functionality, navigation, illustrations, clarity of instructions technical features etc.

Testing

26. Alpha Testing - The artefact (programme) is placed into the hands of the user testing group. Attention is given to installation and configuration problems (programmes), and function improvements that were not tested during the design and development stage. Tasks are set for the user testing group to undertake encompassing the full function of the artefact (task list). The team inspects all elements (e.g. visuals, scripts, interaction etc.).

27. Evaluation and Enhancements - Results of Alpha testing. (Sign Off)

28. Beta Testing - This is the last stage before release to the end user. Tests occur using the delivery mechanism in the field, tested by as wider range of the proposed users.

29. Evaluation and Critical Amendments - Any bugs in the programme are recorded, critical bugs are fixed, others may form the starting point of future maintenance.

30. Produce Master

31. Duplication

32. Delivery

Review

33. Monitor and Control - During the production and testing phase, progress against the work plan is regularly reviewed so that schedules remain realistic and any necessary changes to the work plan can be managed.

34 Post Production Activities -

Post project Review - Project/Production team assesses success of project, and lessons learnt for next time.

Archive - All project documentation and media elements archived.

Evaluation Plan - any course evaluation following product realised is planned.

Maintenance Plan - Dates agreed with course sponsor for maintenance reviews and updates.

Part 5 of 8

Project/Development Team Roles

(Figure 4)

- Analyst
- Production Manager
- Evaluator
- Script Writer
- Media Designer/s (graphics, animation, video, audio)
- Author/Programmer
- Producer
- Project Team
- Production Team

Part 6 of 8

Roles - Key Skills and Knowledge

(Figure 5)

A preliminary outline of skills and knowledge.

Analyst

Skills:

- Undertake Needs Analysis (NA)
- Ability to sift through and condense lots of information
- Interviewing, writing questionnaires
- Research, analysis, report writing
- Writing objectives, writing rule sets/ task analysis/learning points

Knowledge Required:

- Cognitive psychology
- Various distance learning solution risk/benefits
- Estimating and forecasting a time and resources

Production Manager

Skills:

- Strong organisation and negotiation skills
- Scheduling
- Saying 'No'
- Problem solving
- Conflict resolution
- Monitor and control
- Purchasing skills
- Resource management skills
- Budgeting and forecasting skills
- Managing user testing groups
- Managing signoffs
- Managing meetings

Knowledge Required:

- Project management tools e.g. MS Project
- Database management tools e.g. MS Access

Evaluator

Skills:

- Communication skills
- Organisational skills
- Managing user evaluation sessions
- Managing signoffs of evaluated artefact (Prototype, Alpha, Beta)

Knowledge Required:

- Psychology of learning
- Human computer Interaction concepts
- Knowledge of evaluation techniques
- Empathy with user needs

Script Writer

Skills:

- Design input
- Write scripts for video, audio, narrative, help screens etc. (for prototyping and full production)
- Write course structure for design proposal
- Interactive flowcharting

Knowledge Required:

- Learning psychology
- Broad understanding of storyboarding

Media Designer (graphics, animation, video, audio)

Skills:

- Communication skills
- Creative and conceptual design
- Prototype building
- Visual aesthetics
- Design of various media types - 2 and 3 dimensional, audio visual (time based media)
- Storyboarding

Knowledge Required:

- Use of various hardware and software tools to produce all the above media types at prototype level
- Use of software and hardware tools to produce graphics and animation to full production level
- Cross platform development and delivery issues

Author/Programmer

Skills:

- Technical consultancy skills throughout project life cycle (input to design proposal)
- Build prototypes
- Build full products/artefacts

Knowledge Required:

- Understanding of storyboarding
- Knowledge of software and hardware to build (author/programme) full product/artefact
- Cross platform development and delivery issues

Part 7 of 8

Roles - Key Skills and Knowledge (cont'd)

(Figure 5)

A preliminary outline of skills and knowledge.

Producer

Skills:

- High level communication skills
- Managing and developing creative concepts
- Creative direction
- Learning psychology
- Budgeting and resourcing
- Managing the design and development process
- Develop and manage team relationships
- Monitoring and control
- Writing proposals and functionality specifications
- Project planning
- Saying 'No'
- Storyboarding

Knowledge Required:

- Good understanding of production process
- Understanding of all disciplines
- Cross platform development and delivery issues

Project / Production Team

Minimum skills each team member should possess:

- Communication skills
- Input to and understanding of interactive flowcharts, storyboards
- Understanding of the production process
- Understanding of project plans
- Understanding of platform and cross platform issues (PC and Mac)
- Broad understanding of storyboarding

Part 8 of 8

Roles and Tasks <i>(Figure 6)</i>	
<ol style="list-style-type: none"> 1. Need/Request - Analyst 2. Terms of Reference - Analyst 3. Research - Analyst 4. Subject Matter Analysis - Analyst 5. Proposal - Analyst 	Needs Analysis

<ol style="list-style-type: none"> 6. Brainstorming - Project Team 7. Set up Project Team - Producer/Production Manager 8. Design Concepts - Project Team 9. Design Proposal - Producer/Production Manager 10. Project Plan - Producer/Production Manager 11. Prototype Script - Scriptwriter 12. Interactive Flow Chart - Project Team (Producer) 13. Testing Specification - Evaluator 14. Prototyping (mock-up) - Media designer/Script writer/Author 15. User Testing Group (mock-up) - Evaluator 16. Artefact Sponsor Prototype Presentation - Producer/Evaluator 	Design and Development

<ol style="list-style-type: none"> 17. Confirm Production Team - Producer/Production Manager 18. Production Briefing - Producer/Production Manager (Production Team) 19. Scripting - Script writer 20. Work Plan and Schedules - Producer/Production Manager 21. Production Storyboard - Production Team 22. Functionality Specifications - Production Team (Producer) 23. Media Production - Media Designer 24. Authoring /Programming - Author/Programmer 25. Testing Specification - Production Team (Producer) 	Production

<ol style="list-style-type: none"> 26. Alpha Testing - Evaluator/Production Manager/Production Team 27. Evaluation and Enhancements - Producer/Evaluator/Production Team 28. Beta Testing - Production Manager/Producer 29. Evaluation and Critical Amendments - Producer/Author/Programmer 30. Produce Master - Producer/Author/Programmer 31. Duplication - Production Manager 32. Delivery - Production Manager 	Testing

<ol style="list-style-type: none"> 33. Monitor and Control - Producer/Production Manager 34. Post Production Activities - Producer/Production Manager/Project/Production Team 	Review

Element 2 - Artefact Reviews: Seeing Drawing / Artist! / Easy Drums / Flight Simulation - Microsoft Combat Flight Simulator (WWII Europe Series)

As outlined in the literature review as part of the background research for the design proposal for this projects TSL artefact I reviewed several technology-based practical skills focused artefacts that helped to inform the design of this project's learning technology artefact. The reviews helped to highlight a number of positive and negative aspects of UXD within each artefacts construct (including pedagogy, interaction and instructional design) and centred primarily on the approach taken to develop user knowledge and skills. With that in mind, I identified problems and discuss a range of UXD issues needed to be taken into consideration when designing and producing these types of learning technology artefacts. Further discussion about UXD (instructional design, interface and interaction design) issues within the context of the design and production of this projects technology supported learning artefact/s are located under Chapter 5 'Design and development' in the accompanying thesis.

Scope and focus of the review

One respondent to the 'Providers Survey' (see chapter 3 of the accompanying thesis), indicated an awareness of the existence of technology supported learning material pertaining to interviewing and or sound recording, referring to an FDTL (Fund for the Development for Teaching and Learning) project at the Royal College of Music. FDTL was funded by the Higher Education Funding Council for England (HEFCE) and the Department for Employment and Learning (DEL). Established in 1995, funds were provided to support the development and dissemination of good teaching and learning practice in higher education. The project identified was 'LiTMus' (Learning and Teaching in Music), a programme of professional development for teachers in higher education. The project was teacher-centric, nurturing a community of teacher practitioners through seminars, discussion groups and web/text-driven study support material. It clearly had little direct relationship with interview or sound recording.

Elsewhere several examples of learning objects did exist, which sought to highlight SRIT issues. One such example was a module 'Microphones and Recording for Radio' (BBC Training and Development 2003). Generally all identified artefacts employed narrated animated sequences to illustrate key SRIT issues. However, in all instances these objects allowed the user to observe but not interact. I have, at the

time of writing, been unable to identify any examples of learning technology artefacts or research that explores or employs TSL within the context of a 'learning by doing' approach to SRIT skill acquisition. Therefore what follows in a summary review of four artefacts, *Seeing Drawing* (Farshad, Shaw, *et al.* 2001), *Artist!* (UBI Soft Entertainment Ltd 2003), *Easy Drums* (Oasis Blue Productions 1999) and *Flight Simulation - Microsoft Combat Flight Simulator (WWII Europe Series)* (Microsoft Corp 1998) that are not SRIT focused. However, each was chosen as a representative example of artefact, which sought in some way or other, to introduce and support non computer-based practical activities such as drawing, playing the drums or flying an aircraft.

I think it is important also to mention and acknowledge the influence artefacts not represented in this review have had on this research project. In a fast evolving digital domain these include artefacts that fall within digital publishing, entertainment, including games and material from both the corporate and independent training sectors. Publishing examples include, *The Real World Multimedia publications Xplora1* (Nelson 1991), *EvE* (Derrickson 1996), Dorling Kindersley's extensive catalogue including *The Way Things Work* (Macaulay 1996). Within the games domain these encompass adventure games such as the *Myst* series, *Myst* (Strand 1993), *Riven* (Miller 1997), *Exile* (Gustafsson 2001); *Revelation* (Fortier 2004) and *End of Ages* (Miller 2005); action games like *Tomb Raider* (Gard 1996), and *Max Payne* (Remedy Entertainment Ltd 2001) and simulators such as *Comanche 4* (Kent 2001), *Microsoft Combat Flight Simulator* (Microsoft Corp. 1998), *PAWS* (Stein 1995); and edutainment examples such as the *Zoombinis* series (Osetrweil & Hancock 1996). This is by no means a definitive list. I also drew on my own experience, since 1995, of developing multimedia material in the corporate training domain.

Drawing and learning (Seeing Drawing)

Drawing and Learning was a three year Teaching and Learning Technology Programme (TLTP) project funded by HEFCE, led by the London Institute and developed in collaboration with Ravensbourne College of Design and Communication, University of Ulster and Falmouth College of Arts.

The project's main aims and objectives were to provide cost effective support with a comprehensive coverage of drawing with an emphasis on observation, skill and accuracy, an understanding of form and space and the production of products that

would improve the ability to utilise software applications for three dimensional modelling.

The project's proposed outcomes included the production of content delivered on CD-ROMs and be designed to be integrated into courses and used for independent learning by students.

What emerged from the project was a DVD-ROM entitled Seeing-Drawing which was described as "the most ambitious + extensive interactive learning package on drawing ever produced" (Farshad *et al.* 2001, inside cover).

The DVD-ROM held a single programme made up of six sections. These were entitled exploration, instrument, method, reflection, understanding and fashion (see Figure 47).

Figure 47 Seeing Drawing - Screen shot of the programme Main Menu.

The descriptions below are taken unedited from the insert pamphlet that accompanied the DVD-ROM.

'Seeing Drawing' as Instrument.

"Drawing as instrument introduces the subject of measured drawing, its tools, techniques, methods and conventions. This section introduces the techniques of computer aided drawing and allows students to familiarise themselves with both the concepts and the complex software which lies behind the discipline."

'Seeing Drawing' as Method.

"Drawing as method shows how different designers use drawing. Extensive use of video material serve to introduce drawing as an essential component of design practice with the aim of helping students to understand the similarities and differences between a wide range of practicing designers."

'Seeing Drawing' as Reflection.

"Drawing as reflection shows how drawings are created in response to a variety of contexts. It is aimed at students with little prior experience of drawing and who lack confidence in their ability. Students work independently on a range of exercises. Solving a range of visual problems as they progress."

'Seeing Drawing' as Understanding.

"Drawing as understanding examines the way in which the eye and the mind react to the visual world, and shows how drawing is an interpretation of that world. Students develop methods of analysis and are encouraged to work independently by solving visual problems and creating, selecting and evaluating images."

'Seeing Drawing' as Fashion.

"Drawing as fashion demonstrates the potential uses of drawing in the world of fashion. It shows the thinking behind fashion drawing and enables students to explore the various aspects of stages of fashion drawing. This section includes many examples from professional designers who were selected for their widely differing approaches."

'Seeing Drawing' as Exploration.

"Drawing as exploration examines the relationship between drawing and the temporal world and drawing in the digital world. It takes students on a journey through various texts and images by well-known artists, asking them to consider the relationship between perception, understanding and artistic creation. Students experiment with interaction and explore the science of seeing."

Each institutional member of the project consortium developed one of the programme's sections. As a result, the programme suffers with issues relating to consistency of interaction and instructional design. Although the programme's focus is chiefly on awareness raising and not the direct acquisition or development of practical skills, it does provide us with an opportunity to view a range of approaches to nurturing reflection, motivation and contextual appreciation.

Drawing as reflection

Drawing as reflection is specifically aimed at first year undergraduates with limited prior experience, possibly lacking in confidence, and of the six sections within the 'Seeing Drawing' DVD-ROM, has the closest user profile to that of DM1006. It is for this reason the review focuses chiefly on 'Drawing as Reflection'

The section's approach challenges the student's perception of drawing and encourages the articulation of opinions in relation to the student's own and other selected drawings through both the written and spoken word. Divided into four elements entitled 'Introduction', 'Truth', 'Eye', and 'Beholder', the section is designed essentially as a linear pathway accessed from either the programme's main menu or information/site icon located on the generic navigation bar

Introduction - using activities to illustrate a point of view

The introduction presents a sequence of five activities interspersed with animated text describing the three elements (Truth, Eye, and Beholder). The five activities include dragging objects into a box and moving the mouse to reveal text (see Figure 48). The activities are used to surreptitiously record mouse movements that are later transformed into drawings. These drawings are presented to the student at the end of the introduction (see Figure 49) and are used to provoke the student into considering the approach to drawing from an alternative viewpoint.

Figure 48 Seeing Drawing - Screen shots of the activities presented in the Introduction element of seeing as reflection.

(A) Opening screen with first drag and drop activity

(B) Second screen reveal activity

Figure 49 Seeing Drawing - Screen shot of the final screen of the introduction element of seeing as reflection.

Screen Text:

"The way you have navigated through this introduction has
itself produced drawings."

"These are unique to your personal navigation."

The introduction provides no instructions nor offers any explanation for the activities. It is not always possible, or for that matter desirable, to initially explain

the true purpose of an activity. We may defer explaining purpose for example to give impact, or aid in the illustration of a concept, as is the case in the 'Introduction'. In such a case I would suggest however that it is important to provide some form of interim meaning so the student sees that the activity is purposeful, and therefore is motivated to complete the task. From the perspective of the student it is possible that the introductory activities could be viewed as little more than mundane, simplistic tasks void of purpose or meaning, and as such there is a danger that the student may opt not to participate.

In designing activities we also need to appreciate the prior skills and experience our users bring to technology-based interactions. Although generalising, it is not unreasonable to suggest that students have a relatively sophisticated relationship with technology today. The prevalence of games consoles, interactive television and the explosion in the popularity of games on mobile phones contribute to this experience (Hermida 2003).

We also need to recognise the importance of not only the nature of the task we design but also the end user's perception of the task.

In 1995 I attended a conference at the Royal Society of Arts in London, where I saw a presentation by Willem Velthoven, now Professor in design with new media at the Universität der Künste Berlin, on his Doors of Perception CD-ROM multimedia Velthoven (1994). Derived from the conference bearing the same name, the CD-ROM conference proceedings got users to navigate through speaker's articles and presentations based on the degree to which they agreed or disagreed with the material they had previously viewed. The process was achieved through the deployment of a horizontal slide bar at the base of the screen (see Figure 50). Velthoven observed that although the slider only registered agree or disagree, being unaware of this users spent time fine-tuning the slider to reflect the degree to which they agreed or disagreed with the previous speaker. In turn this also appeared to alter the users' perception of the subsequent material they were shown (Velthoven 2003).

Figure 50 Doors of Perception CD-ROM - Agreeing or disagreeing with a speaker.

The user drags the icon at the bottom of the screen from left or right to indicate if they agree or disagree with the speaker.

Velthoven's observation of users interacting with the 'Doors of Perception' CD-ROM illustrates how important it is to consider the presentation of a task and how the user can attribute unintended meaning to a task.

Facilitating reflection and collaborative learning within 'Truth'

Returning to the Seeing Drawing DVD-ROM, after the introduction the first element presented is 'Truth'. In this element students are encouraged to express their opinions and articulate their decision-making choices through the selection of a collection of existing drawings, presented within the context of a gallery, (see Figure 51 & Figure 52) and the creation of their own drawings (see Figure 53) produced in response to a selected statement chosen from a list.

Figure 51 Seeing Drawing - Gallery activity of the "Truth" element of seeing as reflection.

Selecting three drawings from within the gallery

Screen Text:

"You can move between the 3 gallery rooms using the navigation buttons in the tool bar below. Select any 3 drawings from these rooms that most interest you."

The student's capabilities are incrementally developed through the repetition and extension of the reflective activities. Having selected three drawings from the gallery (See Figure 51), the student is asked to select from a list two descriptors that best describe their feelings about the drawing (see Figure 52). After the student has assigned two words to each drawing they are then asked to expand on this by typing a minimum of twenty words explaining why they chose each of the words.

Students are invited to alternatively develop their own 'key words' if they feel the earlier word choice was too limited.

The student's reflection on the drawings is nurtured initially through the prompts provided in the word list. This initial simplified reflection is stretched or developed by encouraging the student to focus on explaining their choices of words in relation to the drawing.

Figure 52 Seeing Drawing - Reviewing selected gallery images with the "Truth" element of seeing as reflection.

Screen Text:

"Please attach 2 words to each of the drawings that best describes your feelings about them."

Using a simplified 'paint' style programme, the student is then asked to produce a drawing in response to a statement selected from a list (see Figure 53). Repeating of the earlier activity (echoing Kolb's learning cycle, see Figure 2), the student is asked to reflect on the drawing they have just created, and describe it in a minimum of 20 words. In this instance no initial keywords are offered upon which the student could draw. By excluding the keywords stage, the activity becomes more challenging. By shifting the focus of the activity to the student's own drawing, it demonstrates how the reflective process can be applied in a personal context.

Figure 53 Seeing Drawing - Creating an image 'Truth' element of seeing as reflection.

Students are instructed to draw as response to a statement they select from a list.
In this instance the statement selected was -
"What is the place you would most like to visit?"

To reinforce the activities covered, at the end of the "Truth" element an opportunity is provided to print a copy of the drawings selected from the gallery

along with the comments generated by the student and those generated by the drawings' original artists (previously unseen). Also included within the print option are the drawing and description created by the student in the later part of the activity (see Figure 54).

Figure 54 Seeing Drawing - Print out option and the end of the 'Truth' element in the drawing as reflection section.

Screen text:
 "You may find it constructive to print these pages
 so that a small group of you - we suggest no more than 3
 others - can use these drawings and your responses as a
 basis for discussion"

Not tied to the confines of the computer, the printed material serves as a reminder to the student, and provides a focal point for later discussions with peers. (An example of collaborative learning, as linked to situated learning is discussed in chapter 2.)

Issues with 'Truth'

There are a number of noticeable issues with the way in which this incremental reflective method has been implemented within the 'Truth' element.

Within a computer-based environment, metaphors are employed to aid human computer interaction (HCI). Metaphors are used to facilitate the understanding of abstract concepts by likening the concept to a familiar activity, object, situation etc. The reviewing activity employs a note pad metaphor to facilitate interaction. A notepad is a familiar object's we know its function, (take notes, doodle, etc.) and limitations (only so much legible text can fit on one page, we can only see one page at a time etc). It therefore could be said we know the characteristics of a notepad. These characteristics are important to our identification or understanding of the object (notepad), situation etc. and are also important in constructing a meaningful metaphorical association. The degree to which one stays true to these characteristics when designing metaphorical objects in a computer-based environment is an important, difficult and frequently overlooked decision.

Looking again at the 'reviewing selected gallery drawings' activity (see Figure 52) the sizes of the selected gallery images represented on the note pad are very small.

Depending on the style of image selected within the gallery, some are virtually indistinguishable. This must hinder the student's ability to meaningfully undertake the review task.

Students are asked to comment on why they chose the text descriptors for each image by typing in the area below the images. They are asked to write a minimum of 20 words. The notepad is however limited to a maximum of forty or so words, inadequate to complete the task meaningfully.

Each of the above problems may have been a consequence of the desire to constrain the behavioural characteristics of the notepad to those of a page from a real pad. Within the section an example already exists where illegibility of images (due to their relatively small size) has been overcome. This exists within the gallery image selection activity, whereby placing the mouse over an image caused the image to enlarge. (See Figure 51, for an illustrated example of this.) This could have formed the basis of the solution for the indistinguishable images on the notepad. In this instance however, to remain true to the characteristics of the pad, the entire pad could enlarge, as if it were being brought closer to the viewer. The lack of typing space is a little more problematic. Providing a page-turning system, as used later in the element when reviewing the sheets for printing (see Figure 54), could provide the mechanism that allows the student sufficient space to complete the task. The consequence of such an approach would result in the images disappearing as the student turned the page, and would require the student to turn the pages back and forth to access the images and text descriptor, and may be undesirable. This brings me back to an earlier point concerning the degree to which one stays true to characteristics of the object, situation etc. upon which the metaphor is based. In the case of the note pad, would it be acceptable to duplicate and repeat the images on all subsequent pages? Would it be better to have the text on a single scrolling page (similar to the function within a word processing application)? I would gravitate towards the first solution; by using the second we would be mixing metaphors by introducing metaphors associated with the Windows operating system. These types of questions and others would be better answered through user testing groups UTG (a representative group of the proposed users/audience who are invited to participate in the design of an artefact). UTGs will form an essential aspect of this research project's artefact design (see Element 1, TSL artefact outline project cycle and chapter 5 of the accompanying thesis).

Another potential issue within this section of 'Drawing as Reflection' is with the use of terminology. Instructions within the 'reviewing' activities use terminology, which could lead to confusion (see Figure 52).

The instructions read:

"Could you now briefly expand on why you have chosen each of the two words for each drawing or please develop your own key words if you feel that the selection has been too limited, using a minimum of 20 words."

The words from which the student selected, were not referred to as 'keywords' at the start of the activity. This term is not part of our everyday vocabulary and its meaning could therefore be uncertain. Its meaning can be inferred from the instructions but it is not made explicit. This may seem trivial or nit-picking but it does remind us to be cautious in the use of terminology. A part of the enculturation of novices, within the construct of situated learning theory, is the adoption of the culture's language. Having said this, I am not confident that the term 'key word' is a part of the culture of drawing. I would suggest it may be more accustomed to the culture of schooling. Irrespective of the question over the cultural relationship of the term "key word", its meaning within the application needs to be made explicit. This could be achieved by labelling or referring to the word list as 'keywords' at the point where the activity is initially carried out as well as in the instructions above. For example, "Could you now briefly expand on why you have chosen each of the two keywords...."

Dispelling preconceptions within 'Eye'

The next element in the section is entitled 'Eye' in which the topic of perspective is introduced. The section offers three alternative linear routes, chosen through the selection of one of three 3-dimensional wire frame forms, consisting of a building, kettle or human figure. The three routes are identical except for each route's concluding exercise.

Having chosen one of the 3-dimensional wire forms, the student is then presented with three reproductions of the form utilising different line and tone drawing techniques. The student is asked to select the one which they feel effectively recreates the 3-dimensional form. An activity then follows which facilitates the comparison of the original 3-dimensional wire frame model and chosen drawing. With the images placed side by side a movable wire frame is placed over the two images to help facilitate comparison of proportions and perspective between the two.

Next the student is asked to write about their drawing selection in light of the comparison they have just made. This activity draws from and builds upon the reflection exercises in the 'eye' element.

The selection, comparison and reflection on the drawings within this activity is intended to challenge the student's perception of 'what is a good drawing' and introduce various drawing styles and techniques.

The element repeats the selection, comparison and reflection activity using an alternative visual perspective of the same 3-dimensional wire frame form, and an alternative set of comparable drawings from which the student must choose. The activity is identical in its conceptual process, and deviates only in the use of a pantograph instead of the wireframe to aid in the comparison of the chosen drawing and 3D wire form (see Figure 55).

Figure 55 Seeing Drawing - Repeat activity comparing proportions and perspective, 'Eye' element in the drawing as reflection section.

Using a pantograph to compare perspective and proportions.

The repetition of activity aids the reinforcement of the concept while also providing the opportunity to introduce two alternative tools.

Emulation

There is a different concluding exercise in each route of the eye element. All follow the same sequence of presentation, starting with a video clip showing one or more students undertaking an exercise or activity, this is then followed by a computer-generated emulation of the exercise or activity for the student to try.

The exercise under route 'A' is entitled 'Without Seeing Drawing' (see Figure 56 & Figure 57). In this exercise students are shown drawing a life model while standing at the side of an easel. Their position relative to the easel prevents them from seeing what they are drawing.

Figure 56 Seeing Drawing - Concluding exercise route 'A' video sequence 'Eye' element in the drawing as reflection section.

Screen text:
"In this exercise the drawing is created by drawing on a piece of paper that is facing away from you so that you cannot see the drawing."

This exercise is emulated in the programme, by obscuring the mark making within a simplified paint application (see Figure 57) The drawing is then revealed when the 'preview' button is selected.

Figure 57 Seeing Drawing - Concluding exercise route 'A' exercise 'Eye' element in the drawing as reflection section.

(A) Hidden Drawing

(B) Revealing the image buy clicking on preview

There is no information presented explaining why the exercise is useful, or otherwise helpful to study.

The video clip under route 'B' shows an activity referred to as 'Consequences' (see Figure 58 & Figure 59). In it students sit around a table playing a drawing game. On a single piece of paper passed around the table, each student in turn contributes to the drawing of a human figure. The paper is folded as it is passed around concealing the contributions of each student. Once all students have contributed, the paper is unfolded to reveal the collective drawing. The video clip is intended to illustrate drawing within different contexts (in this instance an informal social context) and suggests that the game being played "demonstrates creative and often quite revealing thoughts" about each of the contributors. The exercise is a collaborative one. If we look from the perspective of an individual participant in the game, at the game's conclusion, the individual's contribution can

be viewed, compared and reflected upon within the context of the other participants' contributions. The game offers an opportunity to view different approaches to mark making (drawing); how the subject matter is approached (in this case the human form) which in turn may, as the exercise suggests, reveal the thoughts of the drawer.

Figure 58 Seeing Drawing - Concluding exercise route 'B' video sequence 'Eye' element in the drawing as reflection section.

Screen text:

"The traditional game of each person drawing a section, folding it with a visual guide for the next section and the next person adding etc. until the last section. The drawing is then unfolded and revealed."

"Drawing can take place in many contexts. The video clip illustrates an impromptu decision by students over lunch to play consequences which demonstrates creative and quite revealing thoughts."

The opportunity for a participant to compare and reflect through collaboration as illustrated in the video clip is not however supported by the programme's exercise. In the programme exercise two figure drawings are generated and completed in four stages. At each stage the computer obscures the preceding drawn element, (see Figure 59 (A)) and randomly shuffles the two drawings. The next body part is then added to both drawings, for example legs, torso or head. The process is repeated until all body parts have been drawn (see Figure 59 (B)). Shuffling of the drawings between the addition of each body part element results in the randomised creation of two figures.

Figure 59 Seeing Drawing - Concluding exercise route 'B' exercise 'Eye' element in the drawing as reflection section.

(A) Drawing two sets of body parts

(B) The mix of body parts revealed

The resulting drawings, I would suggest, provide some amusement but do not offer the comparative and reflective opportunities of the collaborative process portrayed in the video clip.

I would also suggest that it is possible to provide a comparative reflective experience within a computer-based emulation of the exercise. The design and approach employed rather than any limitation of computer-based environment precluded this in the Seeing Drawing example.

One approach would be to generate a virtual peer group with whom the student could interact and compare contributions. These virtual contributions to the drawing could come originally from drawings generated by a real peer group using similar drawing tools and as such would facilitate a genuine comparison with the contribution produced by the student completing the exercise. Three virtual peers could simply be represented on the computer by means of a photograph. The computer could randomly select when each of the virtual peers and student contribute to the body part elements.

The virtual environment is by no means perfect; it precludes social interaction of a real world environment, but it does offer a form of engagement more closely emulating the real activity as shown in the video clip.

“Moving the paper” is the title of the final exercise under route ‘C’. The video clip demonstrates an activity performed collaboratively between two students. One student holds the media, in this instance a pencil, stationary while the other creates a drawing by moving the paper. (See Figure 60)

Figure 60 Seeing Drawing - Concluding exercise route ‘C’ video sequence ‘Eye’ element in the drawing as reflection section.

Screen text:
 “In this context the work is done in pairs. One holds the media and the other draws by moving the paper.”

Key to recreating the activity on the computer is a thorough understanding of the activity as it is performed in the real world. In the video example we are shown a collaborative activity, and we could reasonably assume that each student in turn attempts the activity. As such both parties could therefore learn by both doing and observing. For example, it may be that one student adopts strategies the other has

not considered; such as asking the student holding the media to lift the media away from the paper, or dragging the paper clear of the media and reintroducing the paper elsewhere. This type of joint exploration/interaction/collaboration helps to enrich both participants. The computer exercise provides no opportunity to observe or attempt alternative approaches. The student is given the task of moving the paper only. The exercise also confines the activity within the boundary of the paper; the media constantly applied to the surface of the paper (see Figure 61).

An alternative approach could be to present the activity in two parts, with the student as paper mover in the first instance while in the second, the computer could assume the role of paper mover, and the student holds the media. The computer could issue instructions to either disengage or reapply the media. It could also demonstrate the strategy of moving the page away from the media and re-introducing it elsewhere. It would be essential that these and other alternate mechanisms be transparent and available for the students to not only observe but also discover and employ themselves when controlling the paper.

Figure 61 Seeing Drawing - Concluding exercise route 'C' computer emulation 'Eye' element in the drawing as reflection section.

Screen text:
"Try drawing an object around you."

Within the three exercises drawing without seeing, consequences and moving the paper, it is left at this point very much to the student to make sense of the exercises' relevance to the development of their drawing skills.

The three alternate routes through the 'Eye' element share the same basic content and activities and differ only in the nature of their concluding exercises. By virtue of the navigation mechanism, access to these alternate exercises is not available without considerable repetition of tasks.

Offering context and promoting confidence

The concluding element 'Beholder' is a review of the student's journey through the 'seeing as reflection' section of the application. The journey is presented as a gallery wall exhibiting the images and texts created from the mouse movements in the introduction, the images selected, generated and written about in the 'Truth' element and the images selected and compared in the 'Eye' element (see Figure 62). From this gallery students are able to enlarge and view these elements. 'Beholder' also provides the rationale for some of the earlier tasks and a concluding summary of the 'drawing as reflection' section that states, "above all there is no right way to draw."

If the student completes all the sections activities the gallery presentation is rather substantial and quite striking and does evoke a feeling of achievement.

Completing or otherwise attempting the introduction, truth and eye elements is crucial to the impact of the 'Beholder' element. Nevertheless 'Beholder' can be accessed without undertaking any of these precursors through the information/map icon on the navigation bar. The gallery seeks to address this by displaying a notice explaining that blank boxes are present where activities or elements have been either skipped or not fully completed.

Figure 62 Seeing Drawing - Concluding gallery page 'beholder' element in the drawing as reflection section.

(A) Gallery page

(B) Opportunity to print the drawings you produced

Placing the rationale/summary for each of the elements and exercises at the end of the drawing as reflection section, would, I suggest, indicate that the authors of the programme expect the students to complete the section in one sitting. This is a poor assumption given the programme's use as an independent learning tool. As an independent learner one would expect to have access to a range of information, not least how long it takes to complete each section or even element. The learner may prematurely end a study session because they perceived that a programme

section, task, exercise, etc. could take a long time to complete. In a directed learning environment, such as a classroom, where the teacher can provide the supplementary information, this may not be an issue. The programme does also have a bookmark feature which would allow the student to return to incomplete sections or exercises. However, one would need to question the effectiveness of offering a rationale or summary for activities and exercises that may have been completed days or even weeks earlier.

Formative evaluation

A small-scale formative (usability) evaluation of the artefact was conducted with five students at the University of Glasgow in March 2001 prior to the programme's final compilation for pressing in May of that year. Through a case study approach the information was gathered via questionnaire, user observation utilising 'thinking aloud' and a 15-minute, paired semi-structured interview.

The evaluation sought to ascertain information about four aspects of the artefact.

- Technical robustness and content accuracy (proofing)
- Identification of potential human-computer interaction (HCI) issues
- The appropriateness and usefulness of content
- The reception the artefact would be given by the target audience (impressions)

The interpretation of the data collected presents a rather optimistic and I would suggest distorted picture. As I have included the full evaluation in the appendices I do not intend to address this 'spin' but wish to highlight some of the findings in a more critical way.

40% of users experienced technical issues with the performance of the programme. I myself have tested the programme across both supported platforms (Apple and Microsoft Windows) and on four separate systems all of which have hardware specifications above the published minimum requirements. Irrespective of platform or system I have experienced technical issues every time I have accessed the programme.

In developing the artefact for this research project it is essential that the production methodology employed includes a rigorous and detailed technical and usability testing phases, prior to the field-test evaluation. (See Element 1 and chapter 5 for the production methodology employed in this research project.)

80% of the users experienced some degree of difficulty with the programme structure and navigation.

All the users who were asked if they had learnt anything from using the programme replied “no”.

The evaluation recommends that the programme be used in a taught situation to address navigational and instructional issues and by doing so would negate the need to redesign the programme.

It will be important that the evaluation of this research project's artefact be both rigorous and critical, based on a robust methodology (see chapter 6 for the project research methodology).

Seeing drawing review summary

The Seeing Drawing programme exhibits many of the issues that are symptomatic of an artefact intending to be too many things for too many people.

Although not explicitly stated in the accompanying documentation, the diversity exhibited in the treatment (information structure, subject matter and pedagogy etc.) of the six sections indicates the intention to cater to an assorted audience of contrasting experience. In some sections, for example, the content has a linear structure befitting inexperienced learners, presenting a clear progression route and building knowledge incrementally, as is the case with ‘Seeing as Reflection’. In other sections the content structure and design suggests a construct suited to knowledge acquisition through unstructured exploration and discovery which may be more suited to the experienced learner.

The programme also struggles to adequately support the dual function of a teaching and independent study aid. It lacks essential information to support independent study and does not provide adequate information to assist pedagogic decision-making.

Seeing Drawing is collection of disparate sections that happen to share the common theme “drawing.” The forced union of these sections, their differing target audiences, and the inability to be able to isolate an exercise/activity or section actually impedes their effectiveness as a flexible learning aid for teachers.

Artist! PC CD-ROM

Also attempting to tackle the development of drawing skills is a commercial product entitled 'Artist!', designed and published by UBI Soft Entertainment Limited and distributed in the UK by Focus Multimedia Ltd. It is an independent study aid aimed at both inexperienced and experienced artists. In contrast to 'Seeing Drawing', 'Artist!' has a robust consistent interface and cohesive structure which benefits from its focus which limits itself to specific aspects of drawing methods. Its inclusion in this review is based on its close association with 'Seeing Drawing' by virtue of its subject matter, and several critical observations I wish to make with regards to pedagogy and approaches to the management of screen content and interface design that will help inform the design of this research project's TSL artefact.

Publicity material for 'Artist!' proclaims:

The equivalent to one year of art classes! Ideal for both beginner and advanced artists this complete drawing course will help you to master those essential techniques and tap into your creative talents. Using a proven and tested educational method, learn the 5 most classic genres; portrait, still life, landscape, life drawing and nude studies using the 40 models, 650 narrated steps and 1,200 drawings available. With each model presented in a linear, step-by-step format with commentary available at all times, it's the easiest way to learn how to draw! (Focus Multimedia 2003, p.1)

Where to start? Supporting the beginner

The publicity material indicates the artefact delivers content in a linear step-by-step manner. With this in mind the most striking aspect of the artefact is the total absence of any help or guidance relating to the functions and features, such as navigation and structure and more importantly, particularly for beginners to drawing, information on where to start and how to study.

The artefact's main menu is divided into two sections, presenting the five drawing genres on the 'main menu' screen while the 'other menu' accessed by a discreet link from the main menu, presents links to information on the use of drawing tools, the study of perspective and a sketching memorisation course (see Figure 63 (A) & (B)).

Figure 63 Artist! - Main and Other Menus.

(A) Main Menu

(B) Other menu

I would suggest that 'hand tools' and 'perspective' are the primary starting points in developing drawing skills for beginners. However, these two key elements have been relegated to a supplementary position in the artefact's construct.

'Hand tools' presents the learner with a variety of video clip examples of techniques in the manipulation of several drawing tools, (see Figure 64) while 'perspective' builds the learner's understanding of the topic through a series of interactive and non-interactive sequences/exercises which can be accessed and carried out either sequentially or randomly through its own topic menu and an associated activity map (see Figure 65 (A) & (B)).

Figure 64 Artist! - Hand Tools Video Demonstration.

Random access to exercises in the perspective topic is in conflict with the step-by-step approach but it does have an advantage in that it facilitates re-acquaintance with individual aspects of the topic's subject matter allowing the learner to use the topic in the latter stages as a reference source. The activity map provides a dual function in that it helps to promote the completion of the topic while facilitating flexible learning, allowing the learner to break away and return to their study at any time.

Figure 65 Artist! - Perspective Topic and Activity Map.

(A) Perspective Topic

(B) Perspective Activity Map

Practice exercises

By contrast the sketching memorisation course also located in the 'other menu', I suggest, is a set of activities primarily intended to facilitate the application and practice of concepts and techniques presented in the main content of the artefact.

The sketching memorisation course provides no guidance or support to learners. Drawing takes place outside the computer environment using real world drawing tools and materials (paper, pencils etc.). The artefact is, in this instance, used as the means of presenting the initial image upon which the drawing will be based, and at the conclusion of each exercise, the presentation of examples of similar attempts to complete the exercise by other artists (see Figure 66 (A) to(C)).

The completion of the exercise on paper or sketchpad provides the learner with tangible material to which they can refer, not tied to the computer environment. This was similarly achieved with the print out function in 'Seeing Drawing' (see Figure 54). The exercise also provides the opportunity for the learner to compare and contrast their response to the exercise against similar attempts facilitating learner reflection. A process repeated throughout the main body of the artefact (see the section entitled 'Facilitating comparison' earlier in this element).

Figure 66 Artist! - Sketching Memorisation Course.

(A) Presenting the image to memorise

(B) Instructed to reproduce the image from memory

Note on the right hand edge of each screen the vertical time line. As the marker passes the icon of the eye, the screen changes from (A) to (B).

When the marker reaches the bottom the time line the screen changes to (C) revealing examples of comparable attempts at the exercise by other artists.

(C) Examples of other artists attempts at the exercise

User preferences and presentation flexibility

Each of the five 'classic genres' contain eight different images or 'models' (see Figure 67) through which the learner is shown concepts associated with 'mass', 'planes', 'line drawing', 'value' (light: White, Black and Grey), and 'realism'. These concepts are referred to in the artefact as 'workshops'.

Figure 67 Artist! - Model Selection in the Nude Studies Drawing Genre.

The five icons located to the bottom right represent each of the five workshop concepts.

To the left, eight alternative models are used to illustrate the workshop concepts.

Once a model has been selected the learner progresses to the workshop area (see Figure 68 (A)). Clarity of information is crucial to the effective delivery of content. Information clarity can be compromised where design or production priorities shift in favour of interface / interaction design. It is important therefore to balance the needs and limitations of the interface metaphor, artefact functionality (including features such as printing, bookmarks, help etc), content structure and the accompanying navigational requirements which these dictate along with the presentation of content. In typographical terms, it means ensuring the legibility of screen-based text is not compromised by reducing its size to fit within a screen interface. The challenge is to design an interface that is flexible enough to facilitate the presentation of the breadth of media (pictures, sound, video animation etc.) intended for use in the artefact, without compromising content clarity/legibility, interface and interaction design. In Seeing Drawing there were issues with clarity of content, in particular the size of images (see 'Issues with Truth' & Figure 52).

Much of the screen content in 'Artist!' is image-based. The ability to be able to view detail within these images is essential. The artefact design addresses this requirement through the implementation of a customisable flexible interface. This flexible interface allows the learner to switch between one of two alternative interface compositions (see Figure 68 (A) & (B)).

Figure 68 Artist! - Flexible Content Presentation 1.

(A) Primary Workshop Screen Composition

(B) Alternative Screen Composition

(C) Cursor Reveals Removed Icons

(D) Exploded Views

Figure 68 (A) is the standard interface and content view and (B) shows an alternative intermediate view that can be selected by the learner. In this interface notice that navigation and tool icons are shifted to the bottom left of the screen. The workshop and other icons at the top of the screen disappear from view and are accessed by moving the cursor to the top of the screen triggering the icons to appear as illustrated in Figure 68 (C).

Figure 68 (D) shows an enlarged view of one of the images; either of them can be enlarged by clicking on the drawing within either the (A) or (B) interface.

It is important to acknowledge that although the alternative interface (B) facilitates the enlargement of the image, it does impact on the direct comparability (scale, proportions etc.) with the photograph of the figures. This may hinder the beginner. Given that both interfaces allow for exploded views of images I would question the need for the alternative interface.

Both interfaces also facilitate the presentation of other media including video (see Figure 69) and reproductions of historical works and student drawings (see Figure 70). Note that the background interface can be seen around the edge of each of these examples and also in the enlarged view in Figure 68 (D). Obscuring the background when introducing alternative media or information can perpetuate the feeling of jumping around the content, while maintaining background referencing helps to preserve user orientation where content is delivered to the user in situ, reinforcing the step-by-step methodology employed by the artefact.

There is a distinct absence of screen text throughout the artefact. This is substituted with audio narration, either automatically activated or triggered by the learner when clicking on the portrait icon located in the lower left of the interface (see Figure 68 (B) for an example of the icon). There is no evidence to suggest the absence of text is a response to any characteristics of the artefact's intended learners e.g. a prevalence of dyslexia. My supposition is that the absence of text is to do with the need not to overcrowd the interface.

Figure 69 Artist! - Flexible Content Presentation 2.

Facilitating comparison

One of the intrinsic features of this artefact is the capability to examine and compare art works by a variety of artists, a feature also found within 'Seeing Drawing' (see Figure 51). 'Artist!' however takes this further by presenting works produced by both the learner's peers, (see Figure 70 (A)) and similar works produced by recognised masters/professionals (see Figure 70 (B)). This feature is employed across all five genres and in part (excluding the professional works) in the sketching memorisation course (see Figure 66).

Figure 70 Artist! - Comparing Works.

(A) Examples of Peer Work

(B) Examples of contemporary and historic works

The presentation of comparable works illustrating a range of differing capabilities is consistent with practices identified not only in 'Seeing Drawing' but also across study practices recoded through the provider survey (see chapter 3 'Methods and resources employed and Figure 24).

Artist! review summary

The degree to which support mechanisms such as help features and "how to use tutorials" are required to facilitate the use of a TSL artefact, could be viewed as an indication of how user-centric or intuitive the artefact is to use. 'Artist!' has no support mechanisms yet is neither user-centric nor immediately intuitive. The design requires the user to engage confidently with the artefact and possess a willingness to explore. So before a learner can meaningfully engage with the content they need to learn how to use the artefact effectively.

As an independent learning programme, there is an absence of any form of study guidance or supervision. One could reasonably expect some information on how to use the material, where to start, how to progress based on the user's individual prior experience, but there is none. Even in paper based study publications there is nearly always guidance in the use of the material. For example Andy Field's *Discovering Statistics* (Field 2000) contains an introduction dedicated to warning and encouraging its readers to read first through the early sections of the book to enable an understanding of concepts covered in later sections. In parts, 'Artist!' utilises a step-by-step construct that you would expect to see when teaching new or inexperienced learners, while in others parts of the artefact it adopts a construct which is more appropriate to support reference-based access to the study material. The lack of guidance and content organisation assumes that learners are required to have some prior formal learning experience in the subject matter to be able to make effective use of the artefact.

Easy Drums

Easy Drums (Oasis Blue Productions 1999) is another example of a commercially available study-based multimedia publication. Its construct is founded on user observation rather than interaction, making extensive use of text to deliver content interspersed with either static illustrations or video with audio sequences.

Organising content

This artefact organises its content into a series of sections accessed via the main menu (see Figure 71 (A)). Background information is provided to facilitate contextual awareness-raising (see Figure 71 (B)), while the main body of the artefact divides itself into three main sections, 'Reading Music', 'Basic Lessons' and 'Advanced Lessons'. Each of these sections contains its own submenu of topics/classes (see Figure 72).

Figure 71 Easy Drums - Main Menu and Instrument Section.

(A) Main Menu

(B) Instrument Section

Of the artefacts so far reviewed, Easy Drums is notably the first to provide the user with a clear structure and overview of content enabling access to content both sequentially and randomly from the section sub-menus.

Figure 72 Easy Drums - Basic Lesson Menu and Overview.

(A) Basic Lesson Section Menu

(B) Basic Lesson Section Overview

Issues with content delivery

Technical issues

Within both the basic and advanced lessons, video and verbal audio sequences are used to demonstrate and explain drumming methods and techniques (see Figure 73 (A) & B)). Developing rhythm is a key goal of this artefact however the persistent loss of audio-video synchronisation impacts on the effectiveness of these sequences to adequately deliver the subject matter. The choice of video media is not inappropriate; it is the technical method employed in the artefact's construction that is at fault. Persistent advances in personal computer performance should enable increasingly complex media-rich delivery, but this can only be achieved if the content is correctly processed and applied. Easy Drums was reviewed on two PCs with specifications far in excess of the minimum published requirements, but the problems with audio-video synchronisation persisted. This would suggest that the issue is with the technical processing of video during the artefact's production rather than the limitations of the delivering computer.

Figure 73 Easy Drums - Basic and Advanced Lessons.

(A) Basic Lesson Section 'Stick Grip'

(B) Advanced Lesson Section 'Time Signatures'

Text and narration

A second issue with the audio and video sequences stems from the conflict between screen text and the verbal audio. My concern derives from knowledge gained from my own experience of producing and testing corporate multimedia training material. Through a number of user trials conducted during the testing of corporate training material for Abbey National PLC, three factors emerged pertaining to the successful combined delivery of verbal audio and screen text.

1. When given audio narrated text users tend to utilise the text to follow the narration.
2. If audio narration and screen text do not match word for word users became distracted by the difference or 'errors' as the users see them to be.
3. Confusion occurs where the user incorrectly anticipated an association between text and verbal audio.

'Easy Drums' use of verbal audio is at first both distracting and confusing, as it appears to initially match the screen text but later deviates substantially from it.

Tutor role and representation

The video sequences, shot always from above, focus on hands, sticks and drums only (see Figure 73 A) & B)), At no time throughout the artefact are we introduced to, or shown the face of, the tutor portrayed in the video clips and through the verbal audio. This clinical depersonalised (anonymous) portrayal of the tutor perpetuates a distancing of the user from information delivered and negatively affects the learning experience. By contrast David Macaulay's 'The Way Things Work 2.0' (Macaulay, 1996) seeks to establish a rapport between learner and virtual tutor. Macaulay himself assumes the role of the virtual tutor. As with Easy Drums, Macaulay also uses video and verbal audio media. Macaulay however attempts to emulate the role of an actual tutor i.e. to inform, encourage, support, guide and nurture the learner (see Figure 74 (A) & (B)).

Figure 74 The Way Things Work - David Macaulay virtual tutor. Copyright Dorling Kindersley

Introducing The Way Things Work

Discussing Hot Air Balloons

Within 'The Way Things Work', the tutor is given a persona. It is the persona that helps to personalise the experience, and establish an emotional link, between the learner and the virtual tutor.

Interaction and input mechanisms

User interaction can be determined or limited not only by the design of the content but also the nature of the hardware input mechanism between user and PC. The most common of these is the keyboard and computer mouse. Other examples include touch-sensitive screens such as those used in kiosks, and game pads, joysticks, steering wheels and pedals used in computer game playing. There is a great deal of research continuing to be carried out in the area of Human Computer Interaction (HCI) much of which encompasses specialist interface hardware/tools. Examples include 'Phantom' (Sensible Technologies 2003) a force feedback stylus

used to plot and work in a 3-dimensional virtual space developed at the Massachusetts Institute of Technology (MIT), and 'CathSim' (Immersion.Com 2003) a vascular access simulator used by healthcare professionals to train in the use hypodermic needles.

I suggest that limitations of input mechanisms need not have precluded the development of drum skills in Easy Drums and that it is the content design and implementation alone that is the limiting factor in this artefact's inability to facilitate skill development via content interaction. The rock group Aerosmith released an album entitled 'Nine Lives' (Shirley 1997) in CD Extra format that included a computer programme which allows an individual to play along with the band's music using a PC keyboard. The principle of the programme is based on matching rhythms. The user selects an instrument, either guitar or drums that they wish to rhythmically replicate (see Figure 75 (A)). The music track is played and the user matches the instrument rhythm, also visually represented as a scrolling peak line (see Figure 75 (B)) by tapping on the spacebar key on the PC keyboard.

Figure 75 Aerosmith Nine Lives - CD Extra 1.

(A) Practice Playing Along with Tracks

(B) Recording the Jam Session

Easy Drums could have adopted a similar mechanism to support the understanding and practice of time signatures, covered in both basic and advanced lessons (see Figure 73 (B)). Further to the use of the keyboard there are commercial third party input mechanisms specifically intended for PC-virtual instrument interactions. Two such devices are the 'Vstix', a drumstick input mechanism and 'Vpick', a guitar plectrum that allows input by dragging the plectrum over a rough surface (see Figure 76 (A) & (B)). In the context of instrument playing, both of these devices offer a more authentic interface for interaction between computer and user.

Figure 76 Aerosmith *Nine Lives* - CD Extra 2.

(A) Virtual Drum Sticks

(B) Virtual Guitar Pick

Determining the input mechanism is another key issue in the design of this project's TSL artefact (see chapter 4).

Easy Drums review summary

Easy Drums is little more than an illustrated book. It is text driven and offers no direct practical skill acquisition or development. The use of audio and video in place of illustrations and text, does facilitate a greater clarity of drum concepts, but is let down by its technical implementation. Content structure allows the artefact to be used readily for both step-by-step study and reference use although its clinical delivery is neither engaging nor inspiring.

Flight Simulation - Microsoft Combat Flight Simulator (WWII Europe Series)

When trying to articulate the characteristics of SRIT skills, during the initial stages of this project, I found myself likening SRIT skills to the multi-tasking skills required to drive a car or fly an aeroplane. This outward similarity led me to explore PC-based flight simulators to see if I could draw upon any of the methods employed to further support the design and production of this project's learning technology-based artefact.

Why Combat Flight Simulator?

Combat flight simulator (CFS) was specifically chosen for review because of its broad audience appeal. CFS is not only a flight simulator but also a flying game offering a range of challenges and objectives, (beyond learning to fly an aeroplane), such as bombing enemy ships and shooting down enemy fighter planes. As such the motivation/objectives of a user of CFS could be considered to be more diverse compared to a fly-only flight simulator. The DM1006 student cohort had a similar diversity of motivation, expectation and objectives regarding SRIT study. It is

because of this similarity, that CFS was chosen for review in place of a fly-only flight simulator.

An outline of Microsoft Combat Flight Simulator

As its title suggests CFS is a flight simulator based around a reproduction of World War II aerial combat. The programme offers a variety of flying based activity, however it is the 'Military Campaign' which is at the heart of CFS user interaction. To embark upon a campaign, users sign up to fly for a country (Germany, England or United States of America) and attempt to progress through a series of missions, accumulating honours, service medals and flying hours, all of which are recorded in the user's individual flight log. This is summed up in the programme's accompanying literature that states:

Choose your campaign: Battle of Britain or battle over Europe. Collect your orders and fly dozens of historically accurate missions involving air-to-air duels with enemy fighter planes and air-to-ground bombing raids. Jump into "Quick Combat" for fast action or go sightseeing around Western Europe in "Free Flight" mode. (Microsoft Corp.1998, retail box rear cover)

Flexible user-defined engagement

The main menu of CFS offers six choices, from the immediate hands-on flying available through the 'Free Flight' and 'Quick Combat' sections, to the structured coaching within the 'Training Missions' and linear progression through the 'Campaign' section (see Figure 77).

Figure 77 Microsoft Combat Flight Simulator - Main Menu Screen.

Screen Text:
 Free Flight
 Quick Combat
 Single Mission
 Campaigns
 MultiPlayer
 Training Missions

Microsoft Combat Flight Simulator Main Menu

Accessed through the main menu, this range of related activities is beneficial in several ways. First, it broadens the scope of the programme by providing individual or grouped activities such as non-combat flying or flight training only. This allows a user who wants only to fly to be able to, likewise a user who wants a combat flight is able to select a mission (see Figure 79 (C)) without having to

embark on a predefined campaign. Providing this range of related but alternative activities helps to prepare a user to undertake more effectively the 'Campaigns'; the activities facilitate the development of a user's skills and knowledge. User development is facilitated in a number of ways.

1) The 'Training Missions' specifically support user development incrementally. This is achieved by breaking down the complex process of flying into manageable segments allowing the user to repeatedly practice a single aspect such as the process of landing an aeroplane (see Figure 78).

Figure 78 Microsoft Combat Flight Simulator - Training Missions.

Missions Include:
Take off
Basic Flight
Low Fuel Landing
Basic Aerobatics

Training Mission Menu

2) 'Free Flight' increases the degree of complexity by providing the user with an opportunity to put the segments of the 'Training Missions' together in a non-combat situation (see Figure 78 (A) & (B)).

Figure 79 Microsoft Combat Flight Simulator - The Different Activity Menus.

(A) Free Flight Menu

(B) Free Flight Activity

3) 'Quick Combat' and the 'Single Mission' provide an opportunity for a holistic but still non-critical experience incorporating combat-based activities with flight. These activities are non-critical because it is only in the 'Campaign' section of the programme where a user's performance/progression is documented, rewarded and potentially halted (in the event of a fatal incident). (See Figure 80 (A) to (D).)

Figure 80 Microsoft Combat Flight Simulator - Campaigns, Debrief, Pilot Log & Killed in Action Screens.

(A) Campaign Section Main Menu

(B) Post Mission - Debriefing and Medal Awards

(C) Pilot Accumulated Flight Log

(D) Killed in Action

Realism and complexity of interaction

CFS further facilitates ease of use across all six activities by allowing the user to select and set either predefined or customisable realism settings for the simulator. (See Figure 81 (A) & (B).)

Figure 81 Microsoft Combat Flight Simulator - Settings.

4 Setting Categories:

Display
Sound Volume
Controls
Realism

(A) Settings Main Menu

Realism Submenu Items:

Aircraft (Flight Model Realism)
 Stores (Amount of Fuel and Ammo)
 Visuals (Sun Glare and G-force effect)
 Combat (Weapon Effectiveness)

(B) Settings - Realism Submenu

The realism setting (ease of use) is defined through the selection and manipulation of a variety of elements, such as level of player invincibility, automated aircraft rudder control, programme simulation speed, and multiple view interface options. The full array of realism elements can be divided loosely into one of three categories, 'Interface', 'Behaviour' and 'Application Performance'.

Interface settings

Interface settings include those functions and features that deal directly with the interaction between the user and CFS. This includes the selection of physical interface or input mechanism (computer mouse, keyboard or joystick), and visual interface or what I would term, "cues and clues", such as the use of colour-coded identification labels trailing aircraft (see Figure 82) employed to help differentiate hostile and friendly aircraft during combat-based missions.

Figure 82 Microsoft Combat Flight Simulator - Enemy Aircraft Identification Option.

RED Text Labels Help To Identify Enemy Aircraft

Within its visual interface settings, CFS offers a wide range of viewing options based on first person perspective, third person perspective and a combination of the two. By adopting a single view first person perspective a user is placed in the position of an actual aircraft pilot. This position is the most realistic and is also the

most challenging (in terms of a user flying an aircraft and engaging in combat) that CFS offers (see Figure 82 (A)). To make flight and combat easier for a user to undertake, CFS offers two further variations of the single view first person perspective. Both of these alternative views modify the interface by slightly altering the perspective. This alteration excludes from view the cockpit instrument panel and in its place, expands the available view out of the aircraft forward window (see Figure 83 (B) & (C)). These expanded views help make flight and combat easier by providing additional visual clues and information to the user, such as the location of enemy aircraft.

Figure 83 Microsoft Combat flight Simulator - First Person Perspective Options.

(A) Cockpit - Panel View

(B) Cockpit - HUD (Head-Up Display)

(C) Cockpit - Maximise

Additionally the third person perspective view and combination viewing options within CFS (see Figure 84) provide many more visual clues and information that help make flight and combat even easier to achieve. These include such elements as the aircraft's orientation and its relative proximity of other aircraft or the ground.

Figure 84 Microsoft Combat Flight Simulator - Multiple First and Third Person Perspective.

Combination Views

Input devices and mechanisms exist (beyond a keyboard and mouse) that can be employed to facilitate greater authenticity of interface between user and computer, such as the 'VStix' (see Easy Drums - Interaction and Input Mechanisms on page 224). There are several input devices commonly associated with computer-based game play (e.g. game pad) but one, the joystick, in particular is closely associated with PC-based flight simulation programmes. However, the joystick is not a device authentic to aeroplanes, which use a yoke (a type of steering wheel on a movable stick), rudder-pedals and throttle as their primary controls. The joystick is more closely associated with the control stick (known as the 'collective') used in helicopters. With this in mind it is of interest to note that within CFS settings the joystick is the only additional input device (to mouse and keyboard) supported.

Within CFS, device input is typically shared between keyboard and mouse. Both are used to manipulate 'Interface', 'Behaviour' and 'Application Performance' settings as well as providing the mechanisms for flying the aircraft during the simulation activities. Because the keyboard and mouse have so many functions, remembering how and in what order they should be manipulated (for example keypad combinations) to perform a particular task is difficult. To help its users, CFS provides a quick reference guide of keypad combinations printed on the back cover of its user manual (see Figure 85 (A) & (B)).

Figure 85 Microsoft Combat Flight Simulator - Mouse and Keyboard Commands.

(A) Quick Reference Guide

(B) Using The Mouse To Change Instrument View

Adding a joystick to CFS is a way of simplifying the number of keyboard and mouse commands a user needs to remember. By connecting a joystick to the PC, CFS assigns it the aircraft flight controls previously assigned to the keyboard and mouse. Thereafter the functions of the keyboard and mouse for the most part are confined to the manipulation of 'Interface', 'Behaviour' and 'Application Performance' settings. The simulated activities, (flying the aeroplane and combat) are carried out primarily using the joystick. Even though the joystick is not authentic to aeroplane control, its ability to simplify interaction may be one of the reasons why the joystick is a CFS supported input device.

In the design and production of this project's artefact it will be important to balance authenticity, complexity of commands and limitations of input mechanisms and devices.

Behaviour settings

Behaviour settings encompass equipment (aircraft and weaponry), people (the pilots) and the environment (weather conditions and time of day).

CFS offers a range of settings related to aircraft and weaponry behaviour. These behaviour settings are located within the settings main menu (see Figure 81 (A)) and the realism submenu (see Figure 81 (B)) and are grouped into four categories, 'Controls', 'Aircraft', 'Stores' and 'Combat'. Under 'Controls' the user is able to simplify the task of flying the aeroplane by automating rudder control (a part of the steering mechanism) and the management of the aeroplane's fuel mixture. Under 'Stores' the user can select to play with unlimited fuel and ammo, while within 'Combat' weapon effectiveness and player invincibility can be selected.

These four settings would seem to be aimed at users who have a preference for combat game play.

Pilot behaviour is defined by three settings.

- 1) Pilot (user) capability/experience is used to determine the level of difficulty within the campaign mission activity (see Figure 86 (A)).
- 2) Enemy (computer) capability/experience also defines the level of difficulty but only within the single mission activity (see Figure 86 (B)).
- 3) G-force (redouts and blackouts) and sun glare visual effects. These settings are applicable across all six of CFS activities, e.g. free flight, quick mission etc. but are relevant only when flying an aeroplane in the first person perspective.

Figure 86 Microsoft Combat Flight Simulator - Defining Pilot & Enemy Settings.

(A) Defining Campaign Pilot Settings

(B) Quick Combat Enemy Settings

CFS allows both the weather conditions and time of day to be defined or adjusted by the user across the six alternative flight and combat activities. The manipulation of these parameters allows the user to adjust further the level of difficulty of an activity.

Application performance settings

Unlike 'Interface' and 'Behaviour' settings that are adjusted to aid or enhance a user's performance, 'Application Performance' settings are primarily defined by, and limited to, the processing capability/performance of the computer upon which CFS is running. These settings (see Figure 81 (A)) adjust graphic quality and sound complexity to help low performance PCs maintain input device responsiveness and deliver smooth motion graphics. The ability to adjust these settings is present because of the commercial need to maximise the range of computers upon which CFS can be used.

It is vital that information critical to supporting the authenticity of the simulated activity is not inadvertently lost through the provision of adjustable application

performance settings. For example, there are some flying situations where the shadow cast on the ground by an aircraft is used by the pilot to help to ascertain aircraft altitude. Because shadows have a critical use in flying, the lowest image quality setting in a flight simulator needs to maintain a basic form of aircraft shadow casting. In the design of a simulator, it is essential to understand how real-world tasks are performed to ensure that any provision for the adjustment of performance settings does not impact on a user's ability to perform simulated tasks.

Microsoft Combat Flight Simulator (WWII Europe Series) Review

Summary

The most striking aspect of CFS is the opportunity it affords the user to define the type, scale and complexity of activities they undertake. Customisation facilitates a variety of types of user engagement enabling those users who seek gratification from unsophisticated immediate play as well as supporting the needs of users who gain gratification through the development and improvement of game play skills and performance.

CFS is clearly not a training application however it does provide a structure for the acquisition and development of skills. The programme provides numerous opportunities to practise. Complex multiple tasks can be broken down into smaller clusters and practised in isolation. Some tasks can be temporarily automated to aid in multi-tasking and non-critical (e.g. not counting to pilot log/performance record) authentic practice can be undertaken through the single missions. Additionally the programme provides specific coaching of isolated skills through its training section.

In designing the artefact for this project consideration needs to be given to user definable customisation in light of the diverse background and experience of the intended users. It will however be important to design customisation options so that they could not propagate an inaccurate understanding of the tasks/skills required for SRIT. The auto-rudder option, which by default is on in CFS, could lead to a casual user misunderstanding the complexity of co-ordination needed (hands for the yoke, and feet for the rudder pedals) to fly an aeroplane.

Element 3 - Project artefact (Recording Coach) preliminary functionality specification

Recording Coach
Preliminary functionality specification.

Version. 0.1 (7/12/2004)

Shell (Framework) - Global Functions / Features			
Ref #	Function/Feature	Attribute	Detail/Constraint
1.0.0	Settings (Or some other name?)		<p>Single location providing access to and control of global settings / functions.</p> <p>Access to settings provided at all times and from all areas within the artefact.</p> <p>Settings should appear in a window overlaid on top of the users current location.</p> <p>Secondary windows open for 'Help' function and quit and 'terminate interview' confirmation.</p> <p>Any activity is suspended while accessing settings. Users location and progress retained if accessed during activity. (User should be able to return and continue where they left off).</p> <p>Settings options will be presented initially during an introductory set up at the each time the programme is started.</p>
1.0.5		Volume	<p>The start movie sets the PC system audio to a mid range setting.</p> <p>Volume control facilitates further adjustment of this setting.</p>
1.1.0		Play Sound	To provide audio feedback for sound level adjustment.

1.1.5		Quit/Exit	<p>Selecting quit will activate a quit alert confirmation message in a secondary window over the settings window.</p> <p>Confirming quit will exit the artefact, cancelling the quit will return the user to the settings window.</p>
1.2.0		Terminate Interview	<p>Terminates any interview in progress.</p> <p>Resets all variables and returns the user to the activity selection menu.</p> <p>(Selecting terminate interview will activate a confirmation alert message presented in a floating window over the settings window).</p> <p>Cancelling 'Terminate Interview' will return the user to the settings window. Confirming 'Terminate Interview' will close the settings window and display the Root Menu #3.0.0.</p> <p>If 'Terminate Interview' is selected without there being an interview in progress, an alert message will be displayed in a floating window.</p>
1.2.5		Close Settings Window	<p>Closes the settings window</p> <p>Returns previous state and location.</p>
1.3.0		Artefact Help FAQ.	<p>Information to support the use of the artefact appears in secondary window with audio commentary and on-screen text.</p>
1.3.5		Hints and Tips	<p>On/Off - provides audio and text based additional information during the various phases of the activity.</p>
Application Start Up			
Ref #	Function/Feature	Attribute	Detail/Constraint
2.0.0	BEFORE YOU START INSTRUCTIONS -		

	Introductory requirements		<p>The artefact starts without audio as safeguard against potential audio volume issues. "Before you start"- Users are told they need headphones and a notepad and pen to use the artefact.</p> <p>"If you have these items click continue else click quit".</p>
		Quit	Quit exits artefact with a quit conformation window. (MIAW the same one used in Settings)
		Continue	Continue takes the user to the next screen 'Audio set-up'.
2.0.5	AUDIO SET UP		
	Adjust Volume Settings - Based on the settings window #1.0.0		Mirrors the audio adjustment in the global settings. And provides an initial point of adjustment to the primary automated start up sound level.
		Play Sound	Users are directed to connect headphones and activate a sound to ascertain appropriate volume level.
		Volume Adjustment	Adjusts level.
		Quit	Quit exits artefact without a quit conformation. Should be in the same location as it was for 'Introductory requirements'.
2.1.0	GLOBAL SETINGS INTRODUCTION		
	"How to" Introduction for Global settings function with skip option		Covers the various functions

		Skip this Introduction and Start Recording Coach	This button takes the user to the activity main menu. The button is active throughout audio set-up to allow fast track through this process.
Root Menu			
Ref #	Function/Feature	Attribute	Detail/Constraint
3.0.0	ROOT MENU OPTIONS		
3.0.5	Practice	Part 1 Sound Recording Only	No final editable sound files generated
		Part 2 Interviewing Only	No final editable sound files generated
3.1.0	Take an Assignment		Editable sound files generated for student to take away
3.1.5	Advice	About SRIT	Show and tell
		Choosing a location	Show and tell
		Selecting the right microphone	Show and tell
		Setting up Equipment	Show and tell
		Conducting the interview	Show and tell
3.2.0	Global Function	Settings	
TAKE AN ASSIGNMENT			
Ref #	Function/Feature	Attribute	Detail/Constraint
4.0.0	PRE-INTERVIEW		
4.0.5	SCREEN 1 - ORIENTATION (Assignment)		

	Orientation and back-story to the interview and interviewee. (A kind of 'Mission Impossible' brief)	Short automated image and sound sequence. (Circa 30sec.) There is no access to global settings during sequence.	A linear sequence presenting both the interviewee, (and their back story) and the primary interview topic. Presented in a window covering much of the stage. Automatically closes after sequence ends.
4.1.0	SCREEN 2 - QUESTION SELECTION (Assignment)		
	Question Selection		From a predefined list of 10 questions (a mix of both open and closed styles) the user has to select 7 questions to employ during the interview.
		Question Order	User is asked to order their selected questions as part of the preparation for the interview. After the questions have been ordered by the user on screen, the user will be instructed to also write down and number the questions in this pre-selected order on a piece paper for reference during the interview.
	Navigation	Continue	Moves the user to Screen 3 Ref # 4.1.5
		Background Info	Replays Back Story (Ref # 4.0.5)
	Global functions/display	Settings	Ref # 1.0.0
		Hints and Tips Display	Enabled/Disabled (keyboard activated/deactivated)
4.1.5	SCREEN 3 - LOCATION SELECTION (Assignment)		
	Choice of location		The user will be able to select one of two alternative locations from which to conduct the interview. A location can be selected immediately or after viewing a location reconnaissance sequence. Selection can be can be changed prior to confirmation.

4.1.6a		Location Reconnaissance for Choice A	The location reconnaissance provides information relating to the characteristics of Choice A location (visual and audio representation of the environment.) (Presented in a large floating window). Also is used as the sequence to introduce commencement of interview if selected as location. (Ref # 4.1.7)
4.1.6b		Location Reconnaissance for Choice B	The location reconnaissance provides information relating to the characteristics of Choice B location (visual and audio representation of the environment.) (Presented in a large floating window). Also is used as the sequence to introduce commencement of interview if selected as location. (Ref # 4.1.7)
4.1.7		Location Selection	A location can be selected and changed either before or after viewing a location recognisance sequence. Location selection is illustrated with visual feedback
	Navigation	Back	Enables the user to return to SCREEN 2 (Ref # 4.1.0) with the previously selected settings retained. (Automatic play of Back Story disabled)
		Continue	Moves the user to the Screen 4 Ref # 4.2.0
	Global functions/display	Settings	Ref # 1.0.0
		Hints and Tips Display	Enabled/Disabled (keyboard activated/deactivated)
4.2.0	SCREEN 4 - EQUIPMENT SELECTION (Assignment)		
4.2.1	Equipment selection. NOTE: (This could be a drag and drop process).	Choice of Microphone	Choice between tie microphone or hand held microphone
		Batteries	Select one or more batteries (Between 1 and 3)
		Headphones	Choose to take or not to take headphones.

		Minidisk player / recorder	
		Blank Minidisk	
	Navigation	Back	Enables the user to return to SCREEN 3 (Ref # 4.1.5) with the previously selected settings retained.
		Go to location	Runs a sequence (In a large floating window) introducing/ travelling to interview location (Ref # 4.1.6a/b) based on user selection (Ref # 4.1.7) Ending with interview interface. (Ref # 5.0.0)
	Global functions/display	Settings	Ref # 1.0.0
		Hints and Tips Display	Enabled/Disabled (keyboard activated/deactivated)
	LOCATION INTERFACE (Assignment)		
5.0.0	EQUIPMENT SET-UP (Assignment)		
5.0.5	Location interface with automatic transition To a table top		Interface determined by (Ref # 4.1.7) Either Location A or B Interview 'environment'.
5.1.0	Transition to table-top interface and equipment set up. (Possible drag and drop) - There maybe need for some task based instruction to tell the user what to do.		Interface transition to close up of table-top and equipment selected by user. (Ref # 4.2.1) Set up can be undertaken by the user in any order and partially complete.
		Insert Battery into Minidisk	If no batteries are included or fitted by the user this should not prevent the interview. It will however effect audio playback (Ref # ??) and provide no final recording (Ref # ??)

5.1.4		Insert Battery into Microphone	<p>If no batteries are included or fitted by the user this should not prevent the interview.</p> <p>It will however effect audio playback (Ref # ??) and provide no final recording (Ref # ??)</p>
		Plug in Microphone	<p>If not plugged in user this should not prevent the interview.</p> <p>It will however effect audio playback (Ref # ??) and provide no final recording (Ref # ??)</p>
		Plug in and Wear Headphones.	<p>If not included or plugged in user this should not prevent the interview.</p> <p>It will however effect audio playback (Ref # ??) and provide no final recording (Ref # ??)</p> <p>User should be asked how they wish to wear head phones.</p> <p>Style A over one ear Style B over both rears</p> <p>No headphone selected or plugged in</p>
		Insert Blank Minidisk	<p>If not included or inserted by user this should not prevent the interview.</p> <p>It will however effect audio playback (Ref # ??) and provide no final recording (Ref # ??)</p>
		Turn on Mic	
		Turn on Minidisk Recorder	This sets the player in record mode.
	Navigation	Click Ok.	"When you are ready click continue."
	Global functions/display	Settings	Ref # 1.0.0
		Hints and Tips Display	Enabled/Disabled (keyboard activated/deactivated)

INTERVIEW INTRODUCTION (Assignment)			
	Interface returns to (Ref # 5.0.5) View. Interviewee sitting opposite.		Interviewee used to guide user in the use of microphone? (Maybe)
	Further Equipment set up depending on Choice of equipment (Ref # 4.2.1) and set up (Ref # 5.1.0)	Tie microphone Placement	Interviewee speaks (audio quality determined by headphone use/selection, Ref # 5.1.4 Picks up the tie microphone and puts it on. (Sequence depends on user action). Tie Microphone always put on by interviewee, comment on turning recorder on is determined by user action - If they have turned the recorder on in #5.1.0
	THERE ARE SEVERAL BRANCHES FOR INTERACTIONS, CONDITIONS AND RESPONSES TO CONSIDER HERE.	Handheld Microphone Placement Held with both mouse buttons down. - If one or other mouse is released this generates mic holding noise.	Interviewee speaks (audio quality determined by headphone use/selection, Ref # 5.1.4 suggests interviewer picks up hand held microphone. "Click on and hold down either mouse button to pick-up and hold the microphone. To ensure there is no noise generated by holding the mic hold it firmly keeping both mouse buttons pressed." - RE-WRITE THIS Interviewee also comments on turning recorder on is determined by user action - If they have turned the recorder on in #5.1.0
	Activity Functions	Review/amend equipment set up	User is able to review and amend equipment set up. (Including turning on).
		Note Pad - Ask Question -	Show the list of pre-selected and ordered questions from # 4.1.0 Keyboard number key association to trigger question. After question asked it's crossed out. Also includes basic instructions e.g. for follow-up questioning. Suggest fixed keyboard assignment for follow up command.

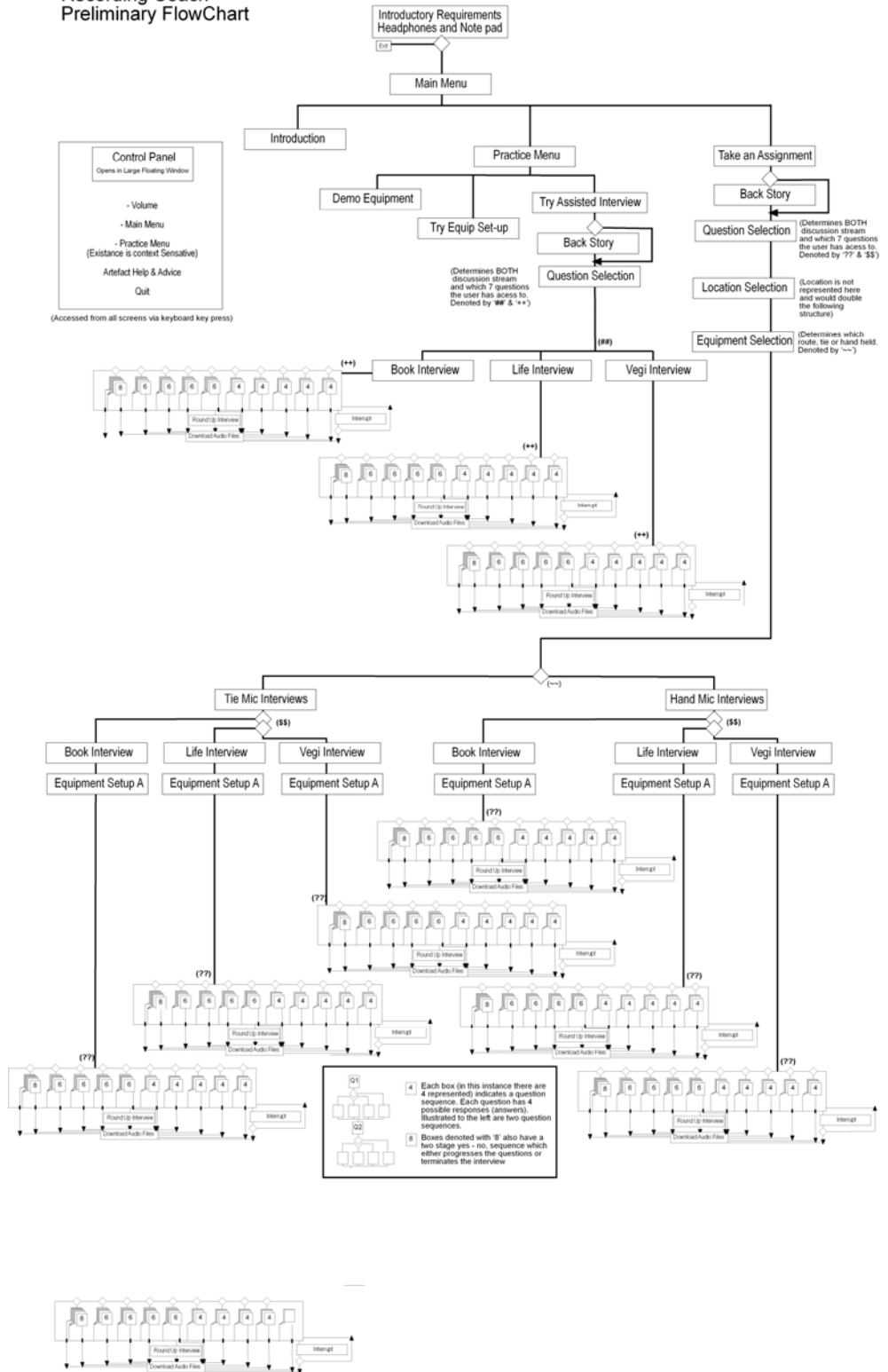
	Global functions/display	Settings	Ref # 1.0.0
		Hints and Tips Display	Enabled/Disabled (keyboard activated/deactivated)
6.0.0	QUESTIONS (Assignment)		
6.0.5			
	Activity Functions	Review/amend equipment set up	User is able to review and amend equipment set up.
		Note Pad - Ask Question	Show the list of pre-selected and ordered questions form # 4.1.0 Keyboard number key association to trigger question. After question asked it's crossed out. Also includes basic instructions e.g. for follow-up questioning. Suggest fixed keyboard assignment for follow up command.
	Global functions/display	Settings	Ref # 1.0.0
		Hints and Tips Display	Enabled/Disabled (keyboard activated/deactivated)
	After the interview		

Audio Treatments			
1	No headphone use		
2	Headphones plugged in and covering both ears. (Tie Microphone)		
3	Headphones plugged in and covering both ears. (Hand Held Microphone)		

4	Headphones plugged in and covering one ear. (Tie Microphone)		
5	Headphones plugged in and covering one ear. (Hand Held Microphone)		
6	A) Headphones plugged in and covering one ear. Microphones / recorder OFF /un-plugged / No batteries.		
	B) Headphones un-plugged and covering one ear.		
7	A) Headphones plugged in and covering both ears. Microphones/recorder OFF/ un-plugged / No batteries.		
	B) Headphones un-plugged in and covering both ears.		

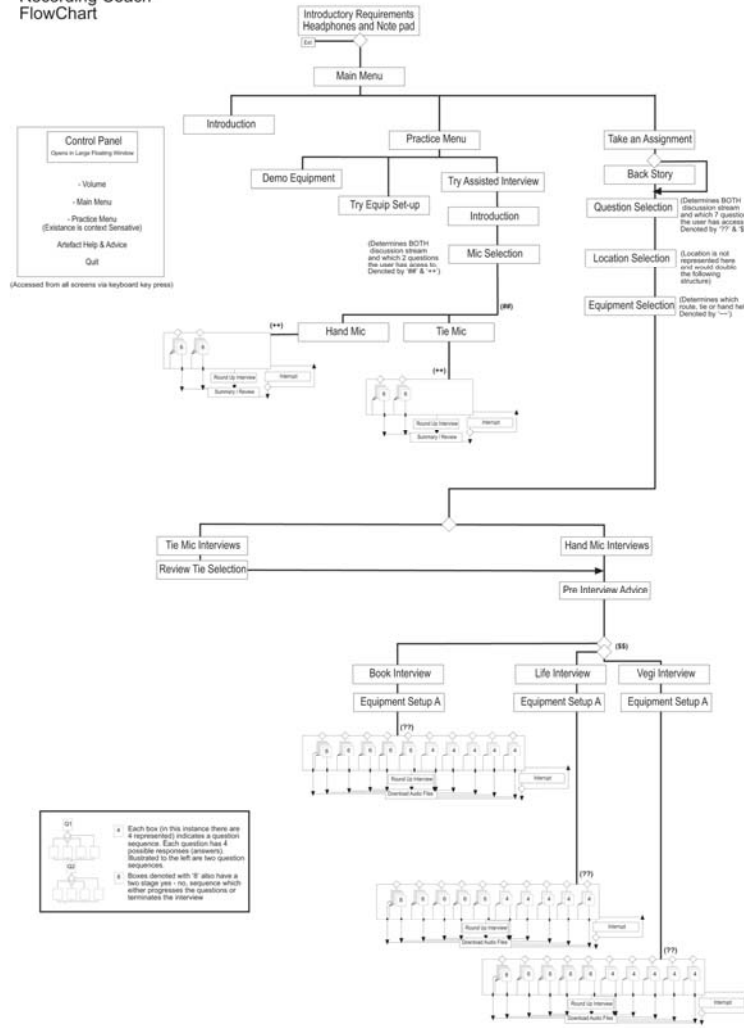
Element 4a - RecordingCoach flow chart v.1

Recording Coach - Preliminary FlowChart



Element 4b - RecordingCoach flow chart v.2

Recording Coach - FlowChart



Element 5 - RecordingCoach scripts



1.0 – Interviewee Back Story:

Margaret Jane Weatherby	
Ref	Info
1	Name: Margaret Jane Weatherby
2	Age: Mid 40's
3	Relationships: Margaret is single. (She has had a couple short term relationships). Given the state of the world Margaret does not consider it appropriate to have a loving partner. At least this is what she tells herself. The truth is she is lonely and throws herself into developing her public persona which is domineering, impatient and emotionally volatile. These traits have increasingly overtime, eclipsed the real Margaret Weatherby. (We do on occasions see fleeting glimpses of her real self, someone who is lonely, vulnerable and desperate to be loved).
4	Education: Margaret went to an all girls boarding school from the age of 7. Against family tradition she skipped the traditional family route to Finishing School and instead she was allowed to go to a new polytechnic to study English Literature.
5	Family Background: The only child, and daughter of Sir Keith Weatherby. Sir Keith is a 5 th generation industrialist. The family primary business being meat processing. The family home is in Leicester.
6	Vegetarian: As part of the agreement (with her father) to study at a polytechnic Margaret had to agree to work in one of her fathers processing plants during each vacation. (The hardship Sir Keith thought would shock Margaret back into the family bosom and put the idea of going to a Polytechnic to bed once and for all). Instead, the exposure to the realities of the family business each holiday vacation resulted in Margaret turning her back on the family. Margaret found working in one of her fathers processing plants incredibly stressful. Knowing that if she refused to work she would not be allowed to return to Poly, she struggled with the brutality of the abattoir so much so that she came close to having a nervous breakdown. During this time she became delusional and experienced an episode, and was the catalyst of her conversion to vegetarianism. She heard the animals praying as they were being slaughtered. This secret Margaret carries with her. She has revealed this only once to her father. Sir Keith reacted by publicly denouncing and disowning her using instead the Trafalgar Square Hens incident (see below) as the rationale. Fearful of public ridicule Sir Keith never divulged his real reasons for this action. He feared that Margaret had become mentally unstable and secretly angst that it was his fault). As time past Margaret becomes convinced that the episode in the abattoir was a divine experience. A gift she was briefly given to afford an insight into the wrong doings of humans. Margaret has remained desperate to reveal this epiphany, but fearful of a similar reaction to her fathers and so is patiently looking for the right circumstances to emerge to reveal this revelation.

		<p>Margaret will only reveal her secret if she's in a good mood.</p> <p>Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p><i>Access the Control Panel to return to the Main Menu and try again!</i></p>
--	--	---

9.3

WALKOUT Video - ALL 3 Streams

WOUT_1	<p>(Shout) Oh, bad luck. True to form she's walked out on you. Press the 'R' key to round-up and retrieve your interview recording. (Yes I'm coming)</p>	<p>VIDEO</p>
WOUT_2	<p>She's walked out has she? Not to worry. Press the 'R' key to round-up and retrieve your interview recording.</p>	<p>VIDEO</p>
WOUT_R	<p>Seriously, she's not coming back. You are going to need to book another appointment if you want to interview her some more. By the way did you get her to reveal her secret? No? Press the 'R' key to round-up.</p>	<p>VIDEO</p>

2.0 - Conversation Variables

2.1

Interviewee Mood (Responsiveness / Behaviour) + Factors that change mood

CLO	3	Annoyed, Offensive, Abrupt	Closed	Mood changes '+ or -' one increment and is associated with questions (e.g the stop questions) response (such as in the Q&A sequence), interruption and in relation to physical placement of the mic (handheld).
GRD	2	Guarded, Suspicious, Reserved	Guarded	
WILL	1	Responsive, Accommodating, Confident	Willing	
OPE	0	Exuberant, Gushing, Receptive	Open	

2.2

Discussion Stream Topics

Book	The Book	"Germain Greer"- The New Margaret of today, Controversial outspoken Author and Public Speaker, Ego.	Discussion stream is denoted by the chosen start question. (Each question also has an associated starting Mood - See above)
Life	My Life	Reminisce, The woman behind the image and message.	
Vegi	Vegetarianisms	Focus on the message "Its not about me".	

2.3

Discussion Stream Trigger Questions (First Listed Question) + Mood

Book	The Book	Q1 How long have you been a vegetarian? - CLO Q2 Are meat eaters bad people? - WILL Q3 What is your view on the use of animal derived by-products? - OPE Q10 Why did you become a vegetarian? - GAR
Life	My Life	Q4 Can you tell me a little about yourself? - WILL Q5 What is the most difficult aspect of being a vegetarian? - OPE Q6 What are your views on animal rights activists? - WILL
Vegi	Vegetarianism	Q2 If you could be granted one wish, what would it be? - CLO Q3 What benefits could one get from a meat free life style? - OPE (Background Noise) Q9 Looking back over the past 20 years, what, in your view is the most significant event which has helped promote vegetarianism? - OPE

3.0 Question Conditions

3.1

Follow-Up (probing) Questions

0a	Follow-up a	Either a Follow-Up or (1 to 3 Stop Answers)	Follow-up questions are variations of the original question and precede Stop Answers. If the third stop answer (CALL_H or (CALL_T)) is activated the interview is terminated. See 4.2 for the list of "Stop Answers"
0b	Follow-up b	Either a Follow-Up or (1 to 3 Stop Answers)	
(c+)	Follow-up c+	(1 to 3 Stop Answers)	

3.2

Repeat Question (Noise Repeat)

Q3 - All Streams and Moods	The Mic version	Noise interference occurs during the primary answer. Pressing the question button will allow the question to be re asked without noise AND an Improved Mood.
Q3 - All Streams and Moods	Hand Held Mic version	

3.3

Repeat a Question (NO Noise)

	If the Question is asked a second time (the keyboard number key pressed) then the Stop Answer sequence is Instigated and Mood +1
--	--

3.4

Interviewee Question sequences (i-O&A)

Q1 DsB - CLO	Yes Hmm so what is the title of my autobiography? (A) Love Life, or (B) Respect Life?	Interviewee asks a Yes - No and 50 - 50 question (2 questions) based on whether or not the interviewee did any preparatory research. A NO answer to research will terminate Interview. A yes answer is probed with a 50 - 50 question. A correct answer will improve the Mood my one increment. An incorrect answer to the 50 -50 will terminate the interview.
Q1 DsL - CLO	Alright what is my middle name then? (A) Helen, or (B) Jane?	
Q1 DsV - CLO	Ok you say you have done the research so answer this. Where do my family live? (A) Leicester, or (B) Derby?	

4.0 Questions and Answers

4.1

Primary and Follow-up Questions and First and Follow-up Answers for Each Stream

The opening question selected by the student will determine the stream of questioning and MOOD		There are 12 responses to each primary question.			
Primary and Follow-up Questions	Mood	Book (DsB) Stream	Life (DsL) Stream	Vege (DsV) Stream	
1 How long have you been a vegetarian? Book - CLO	CLO	<p>1CLO_B (a) Come on now surely you can do better than that. This is well documented. Have you done any research about me? Y/N</p> <p>1CLO_B (b) Yes-Hmm so what is the title of my autobiography? (A) Love Life, or (B) Respect Life?</p> <p>1CLO_B (c) A - Ok so you have done some research in which case you'll know its been a long time. Mood -1</p> <p>1CLO_B (d) N or B - Really I frankly don't see the point of this interview if you haven't even tried to research my background. This is a waist of my time. (Gets up an leaves)</p>	<p>1CLO_L (a) A long time. Have you done any research about me? Y/N</p> <p>1CLO_L (b) Ok you say you have done the research so answer this: Where do my family live? (A) Leicester, or (B) Derby?</p> <p>1CLO_L (c) A - Ok (Nods) Mood -1</p> <p>1CLO_L (d) N or B - Look here I have given you my time. At least you could have done the research. This is just not good enough. (Gets up an leaves)</p>	<p>1CLO_V(a) A lot of years Did you do any preparatory research? Y/N</p> <p>1CLO_V(b) Alright what is my middle name then? (A) Helen, or (B) Jane?</p> <p>1CLO_V(c) B - not many people make note of this, well done! Mood -1</p> <p>1CLO_V(d) N or A - oh come on really. Your lying or what research you have done is worse than useless. Go away and come back when you have done a proper job. (Gets up an leaves)</p>	

1a	Do you remember when you made the decision to stop eating meat?					
		GRD	1GRD_B I talk about this in my autobiography, "Love Life". It's a long time but I remember it vividly.	1GRD_L I made the decision to stop eating meat a long time ago.	1GRD_V I have been a vegetarian for a number of years.	
		WILL	1WILL_B In "Love Life", my autobiography, my latest book, I think I indicate it has been over two decades.	1WILL_LV I've been a vegetarian ever since my mid twenties.	1WILL_V I've been a vegetarian ever since my mid twenties. (Duplicated Answer 1 WILL (Dsb))	
		OPE	1OPE_B When I was compiling material for my autobiography I was looking through an old diary, it's been a long time, in fact a very long time.	1OPE_L I have been a vegetarian for over two decades. It was a simple life choice.	1OPE_V I suppose in my heart I'd have to say I have always been a vegetarian.	
		CLO	1aCLO_B Yes.	1aCLO_L I do yes.	1aCLO_L Of course	
		GRD	1aGRD_B/LV Yes. While I was at College.	1aGRD_L Yes. While I was at College (Duplicated Answer 1a GRD (Dsb))	1aGRD_V Yes. While I was at College (Duplicated Answer 1a GRD (Dsb))	
		WILL	1aWILL_B Of course it was an important decision. Its like completing your first book, you never forget it.	1aWILL_L Yes. You don't forget a thing like that.	1aWILL_V My College years were a real eye opener. I converted while at College.	
		OPE	1aOPE_B Yes it helps that I have spent time reminiscing for my autobiography. I was at home during a vacation from College. I had been working at one of fathers factories.	1aOPE_L Yes, laughs. I was on vacation from College and at home in Leicester. I'd just finished working at the factory. We were all around the dining table.	1aOPE_V I stopped eating meat while at college I suppose I had an epiphany. There is too much suffering in the world. Why contribute unnecessarily to this.	

1b	So how many years has it been?	CLO	1bCLO_BILV 22 years.	22 years. (Duplicated Answer 1b CLO (DsB))	22 years. (Duplicated Answer 1b CLO (DsB))
		GRD	1bGRD_BILV I stopped eating meat 22 years ago.	I stopped eating meat 22 years ago. (Duplicated Answer 1b GRD (DsB))	I stopped eating meat 22 years ago. (Duplicated Answer 1b GRD (DsB))
		WILL	1bWILL_B Are you trying to make me feel old? It's been 22 years.	1bWILL_L Two decades and two years. 22 years give or take a month or two.	1bWILL_V if you are pushing me for an answer, then I've been a vegetarian, for 22 years.
		OPE	1bOPE_B Has what been? I suppose you mean since I ate meat. I get asked this all the time, without fail,22 years.	1bOPE_L I suppose it must have been 22 years since I last ate meat. You know we all, each of us have a responsibility to stand up for our beliefs.	1bOPE_V The number of years is not important. It is the fact that I made the decision. But as you have persisted in asking it 5 22 years.
1c	Does it feel so long? Mood +1	CLO	STOPaCLO	STOPaCLO	STOPaCLO
		GRD	STOPaGRD	STOPaGRD	STOPaGRD
		WILL	STOPaWILL	STOPaWILL	STOPaWILL
		OPE	STOPaOPE	STOPaOPE	STOPaOPE
1d	When you started did you count the days? Mood +1	CLO	STOPaCLO	STOPaCLO	STOPaCLO
		GRD	STOPaGRD	STOPaGRD	STOPaGRD
		WILL	STOPaWILL	STOPaWILL	STOPaWILL
		OPE	STOPaOPE	STOPaOPE	STOPaOPE
1e	Are you happy with your choice? Mood +1	CLO	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
		GRD	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
		WILL	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
		OPE	STOPaOPE	STOPaOPE	STOPaOPE

	OPE	STOP=ALL_T/H	STOP=ALL_T/H	STOP=ALL_T/H
2	<p>if you could be granted one wish, what would it be?</p> <p>Life - CLO</p>	<p>ZCLO_B/L/V I'd wish I could stop doing interviews like this.</p> <p>ZGRD_B I'd love to have more time to write.</p> <p>WILL ZWILL_B If I was granted one wish, I'd wish to have more time for writing books.</p> <p>OPE ZOPE_B Given I can't wish for another 1000 wishes I'd wish to have more time to spend writing.</p>	<p>I'd wish I could stop doing interviews like this. (Duplicated Answer 2b CLO (D5B))</p> <p>ZGRD_L I'd wish to be famous.</p> <p>ZWILL_L If I had one wish I would wish that I hadn't gotten my self involved in that Trafalgar Square fiasco. (Smiles)</p> <p>ZOPE_L It's simple. I would wish to have a thousand more wishes.</p> <p>ZaCLO_L I say this because it's what people expect to hear from me, but I'd wish to have more time to myself. I am so busy these days.</p> <p>ZaGRD_L I say this because it's what people expect to hear from me, but really it would be nice to have some time to my self.</p>	<p>I'd wish I could stop doing interviews like this. (Duplicated Answer 2b CLO (D5B))</p> <p>ZGRD_V I'd wish we were all vegetarians</p> <p>ZWILL_V I would demand that the needless slaughter of animals stops. It is unnecessary and there is no excuse.</p> <p>ZOPE_V All life is equal. I would like to think that we can all live with this as our mantra. This is would be my wish.</p> <p>ZaCLO_V Because.</p> <p>ZaGRD_V I think that's obvious.</p>
2a	<p>Why this wish?</p>	<p>ZaCLO_B So much of my time is taken up with interviews.</p> <p>ZaGRD_B Because I love writing and I want to spend more time reaching people this way.</p>	<p>I say this because it's what people expect to hear from me, but I'd wish to have more time to myself. I am so busy these days.</p> <p>I say this because it's what people expect to hear from me, but really it would be nice to have some time to my self.</p>	<p>ZaCLO_V Because.</p> <p>ZaGRD_V I think that's obvious.</p>

	OPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE
2d	What are your views on wishing? Mood +1	CLO GRD WILL OPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE
2e	Is wishing harmful? STOP INTERVIEW	CLO GRD WILL OPE	STOPaCLO_T/H STOPaGRD_T/H STOPaWILL_T/H STOPaOPE_T/H	STOPaCLO_T/H STOPaGRD_T/H STOPaWILL_T/H STOPaOPE_T/H	STOPaCLO_T/H STOPaGRD_T/H STOPaWILL_T/H STOPaOPE_T/H
3T	TIE VERSION What are the benefits to being a vegetarian? Vogl - OPE <i>Margaret Knocks the tie mic by scratching herself in all takes</i>	CLO GRD WILL	3CLO_BILV (Noise) There are too many to mention. 3GRD_B (Noise) You'd best read one of my books for that answer. 3WILL_B (Noise) Yes there are benefits. I've written about many of them.	(Noise) There are too many to mention. (Duplicate Answer 3T CLO (D5B)) 3IGRD_L (Noise) Vegetarianism is beneficial all round. 3WILL_L (Noise) The benefits of vegetarianism are easy to see.	(Noise) There are too many to mention. (Duplicate Answer 3T CLO (D5B)) 3IGRD_V (Noise) Vegetarianism is not only a personal but also a social commitment to improvement. 3WILL_V (Noise) Vegetarianism is good for ones spiritual well being

3M	HAND HELD VERSION What are the benefits to being a vegetarian? Veg1 - OPE <i>Burglar Alarm sounds across all takes.</i>		OPE	3OPE_B (Noise) In "To Die for", my first book, I cover such information. Think about it in recent years we have had Salmonella, C.JD, what's next? 3mOPE_BILV (Noise) There are too many to mention.	3OPE_LV (Noise) vegetarianism is a life changing experience. (Duplicated Answer 3T OPE (D5L))	(Noise) vegetarianism is a life changing experience. (Duplicated Answer 3T OPE (D5L))
		CLO	3mOPE_BILV (Noise) There are too many to mention.	(Noise) There are too many to mention. (Duplicated Answer 3M CLO (D5B))	(Noise) There are too many to mention. (Duplicated Answer 3M CLO (D5B))	(Noise) There are too many to mention. (Duplicated Answer 3M CLO (D5B))
		GRD	3mGRD_B (Noise) You'd best read one of my books for that answer.	3mGRD_L (Noise) Vegetarianism is beneficial all round.	3mGRD_V (Noise) Vegetarianism is not only a personal but also a social commitment to improvement.	3mGRD_V (Noise) Vegetarianism is not only a personal but also a social commitment to improvement.
		WILL	3mWILL_B (Noise) Yes there are benefits, I've written about many of them.	3mWILL_L (Noise) The benefits are easy to see.	3mWILL_V (Noise) Vegetarianism is good for ones spiritual well being	3mWILL_V (Noise) Vegetarianism is good for ones spiritual well being
		OPE	3mOPE_B (Noise) In "To Die for", my first book, I cover such information. Think about it in recent years we have had Salmonella, C.JD, what's next?	3mOPE_LV (Noise) vegetarianism is a life changing experience.	(Noise) vegetarianism is a life changing experience. (Duplicated Answer 3R OPE (D5L))	(Noise) vegetarianism is a life changing experience. (Duplicated Answer 3R OPE (D5L))
3R	REPEAT QUESTION (Both) What are the benefits to being a vegetarian? Mood -1		3CLO_BILV There are too many to mention.	There are too many to mention. (Duplicated Answer 3R CLO (D5B))	There are too many to mention. (Duplicated Answer 3R CLO (D5B))	There are too many to mention. (Duplicated Answer 3R CLO (D5B))
		GRD	3mGRD_B You'd best read one of my books for that answer.	3mGRD_L Vegetarianism is beneficial all round.	3mGRD_V Vegetarianism is not only a personal but also a social commitment to improvement.	3mGRD_V Vegetarianism is not only a personal but also a social commitment to improvement.

	WILL	3aWILL_B Yes there are benefits. I've written about many of them.	3aWILL_L The benefits of vegetarianism are easy to see.	3aWILL_V Vegetarianism is good for ones spiritual well being
	OPE	3aOPE_B In 'To Die for', my first book, I cover such information. Think about it in recent years we have had Salmonella, CJD, what's next?	3aOPE_LUV Vegetarianism is a life changing experience.	(Duplicated Answer 3R OPE (DSL))
3a	CLO	3aCLO_BILV Yes of course.	Yes of course. (Duplicated Answer 3a CLO (DSB))	Yes of course. (Duplicated Answer 3a CLO (DSB))
	GRD	3aGRD_BILV Without question, it's best all round.	3aGRD_L It's a great way to live and yes a healthy way to live.	3aGRD_V There is no need to eat meat to sustain a healthy life. You can get all your body needs from other sources.
	WILL	3aWILL_B I think the facts speak for themselves.	3aWILL_L Sure but it's not just about health it's also a moral choice.	3aWILL_V I can do, if you take a holistic approach to obtaining from using all animal products
	OPE	3aOPE_BILV Not if you smoke, or live next to a power station, no. It can give you a healthier life.	Not if you smoke, or live next to a power station, no. It can give you a healthier life. (Duplicated Answer 3a OPE (DSB))	Not if you smoke, or live next to a power station, no. It can give you a healthier life. (Duplicated Answer 3a OPE (DSB))
3b	CLO	3bCLO_BILV How would I know? For all I know you might get knocked down by a bus on your way home?	How would I know? For all I know you might get knocked down by a bus on your way home? (Duplicated Answer 3b CLO (DSB))	How would I know? For all I know you might get knocked down by a bus on your way home? (Duplicated Answer 3b CLO (DSB))

	GRD	3bGRD_B Yes.	3bGRD_L Maybe.	3bGRD_V it depends on what else you are doing in your life.
	WILL	3bWILL_B What do you think?	3bWILL_L Yes, for ever.	3bWILL_V It's possible.
	OPE	3bOPE_B Sure.	3bOPE_L It can help.	3bOPE_V I suppose so, yes.
3c	CLO	STOPaCLO	STOPaCLO	STOPaCLO
	GRD	STOPaGRD	STOPaGRD	STOPaGRD
	WILL	STOPaWILL	STOPaWILL	STOPaWILL
	OPE	STOPaOPE	STOPaOPE	STOPaOPE
3d	CLO	STOPaCLO	STOPaCLO	STOPaCLO
	GRD	STOPaGRD	STOPaGRD	STOPaGRD
	WILL	STOPaWILL	STOPaWILL	STOPaWILL
	OPE	STOPaOPE	STOPaOPE	STOPaOPE
3e	CLO	STOPaCLO	STOPaCLO	STOPaCLO
	GRD	STOPaGRD	STOPaGRD	STOPaGRD
	WILL	STOPaWILL	STOPaWILL	STOPaWILL
	OPE	STOPaOPE	STOPaOPE	STOPaOPE
	CLO	STOPaCLO	STOPaCLO	STOPaCLO
	GRD	STOPaGRD	STOPaGRD	STOPaGRD
	WILL	STOPaWILL	STOPaWILL	STOPaWILL
	OPE	STOPaOPE	STOPaOPE	STOPaOPE

4	Who is Margaret Weatherby? Life - WILL	CLO	4CLO_B Margaret Jane Weatherby is an author.	4CLO_LV A woman on a mission.	4CLO_DS A woman on a mission. (Duplicated Answer 4 CLO (DsL))
		GRD	4GRD_B I think I'm best described as an author.	4GRD_L Margaret Weatherby is a Woman on a mission.	4GRD_V A vegetarian
		WILL	4WILL_B I would say I'm probably best known for my campaigning, but I'm actually an author.	4WILL_L Who is Margaret Weatherby? Well I'd have to say she is an advocate for moral healthy life styles.	4WILL_V I am a campaigner, some would say an activist for vegetarianism and animal welfare
		OPE	4OPE_B I suppose I could be called a public figure but I'm an author.	4OPE_L A life style campaigner	4OPE_V Margaret is a controversial figure in the vegetarian movement.
4a	What drives you to do what you do?	CLO	4aCLO_BILV My conscience	4aCLO_L My continence	4aCLO_DS My continence (Duplicated Answer 4a CLO (DsB))
		GRD	4aGRD_BILV A sense of Morality	4aGRD_L A sense of Morality	4aGRD_V A sense of Morality (Duplicated Answer 4a GRD (DsB))
		WILL	4aWILL_BILV The knowledge that I know I am right.	4aWILL_L The knowledge that I know I am right.	4aWILL_V The knowledge that I know I am right. (Duplicated Answer 4a WILL (DsB))
		OPE	4aOPE_BILV The over whelming drive to save people from themselves	4aOPE_L The over whelming drive to save people from themselves	4aOPE_V The over whelming drive to save people from themselves. (Duplicated Answer 4a OPE (DsB))

4b	What are you doing now?	CLO	4bCLO_BILV I'm currently talking to you.	I'm currently talking to you. (Duplicated Answer 4b CLO (D5B))	I'm currently talking to you. (Duplicated Answer 4b CLO (D5B))
		GRD	4bGRD_B Promoting my latest book.	4bGRD_L I'm spending a lot of time away from home, lecturing and promoting my ideas	4bGRD_V Promoting my work
		WILL	4bWILL_BILV I currently lecture, campaign and write.	I currently lecture, campaign and write. (Duplicated Answer 4b WILL (D5B))	I currently lecture, campaign and write. (Duplicated Answer 4b WILL (D5B))
		OPE	4bOPE_B It's a bit of a nightmare, when you publish a book. Your publisher requires you to spend a great deal of time and effort promoting the material.	4bOPE_L I'm spending a lot of time away from home, lecturing and promoting my ideas	4bOPE_V Lecturing and promoting my latest publication.
4c	Is money important? Mood +1	CLO	STOPaCLO	STOPaCLO	STOPaCLO
		GRD	STOPaGRD	STOPaGRD	STOPaGRD
		WILL	STOPaWILL	STOPaWILL	STOPaWILL
		OPE	STOPaOPE	STOPaOPE	STOPaOPE
4d	Is controversy important to your success? Mood +1	CLO	STOPaCLO	STOPaCLO	STOPaCLO
		GRD	STOPaGRD	STOPaGRD	STOPaGRD
		WILL	STOPaWILL	STOPaWILL	STOPaWILL
		OPE	STOPaOPE	STOPaOPE	STOPaOPE
4e		CLO	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H

Your books could be described as "vanity" publications. Have you ever attempted to have your work published by independent publishers? STOP INTERVIEW		GRD	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H
		WILL	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H
		OPE	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H
5	Are meat eaters bad people? Book - WILL	CLO	5CLO_B/LV Now that's a loaded question	Now that's a loaded question (Duplicated Answer 5 CLO (D&B))	Now that's a loaded question (Duplicated Answer 5 CLO (D&B))	Now that's a loaded question (Duplicated Answer 5 CLO (D&B))
		GRD	5GRD_B It's not a good idea to alienate yourself or the people you are trying to talk to.	5GRD_L If doing bad things makes you a bad person, then yes.	5GRD_V It depends on your views.	5GRD_V It depends on your views.
		WILL	5WILL_B There's not an easy answer.	5WILL_L If you know no better then no, eating meat does not make you a bad person.	5WILL_V There is good and bad in every one.	5WILL_V There is good and bad in every one.
		OPE	5OPE_B I would hope that those people how read my books will see the error of their ways.	5OPE_LV Children eat what they are given or what they are taught to eat. I can't say they are bad.	5OPE_V Children eat what they are given or what they are taught to eat. I can't say they are bad.	5OPE_V Children eat what they are given or what they are taught to eat. I can't say they are bad.
5a	Is meat eating immoral?	CLO	5a_B Again that's a loaded	5aCLO_L Yes	5aCLO_V Without question	5aCLO_V Without question
		GRD	Again that's a loaded (Duplicated Answer 5a CLO (D&B))	5aGRD_L It's a moral choice yes.	5aGRD_V Yes Meat eating is immoral.	5aGRD_V Yes Meat eating is immoral.
		WILL	Again that's a loaded (Duplicated Answer 5a CLO (D&B))	5aWILL_L I understand that its contentious but the simple answer is yes.	5aWILL_V If you eat meat your spiritual wellbeing is at risk	5aWILL_V If you eat meat your spiritual wellbeing is at risk

	OPE	Again that's a loaded (Duplicated Answer 5a CLO (DsB)) 5b_BILW Yes I believe it is	5aOPEL_L Sure	5aWILL_V Absolutely
5b Is vegetarianism a spiritual choice?	CLO	Yes I believe it is	Yes I believe it is (Duplicated Answer 5b CLO (DsB))	Yes I believe it is (Duplicated Answer 5b CLO (DsB))
	GRD	Yes I believe it is (Duplicated Answer 5b CLO (DsB))	Yes I believe it is (Duplicated Answer 5b CLO (DsB))	Yes I believe it is (Duplicated Answer 5b CLO (DsB))
	WILL	Yes I believe it is (Duplicated Answer 5b CLO (DsB))	Yes I believe it is (Duplicated Answer 5b CLO (DsB))	Yes I believe it is (Duplicated Answer 5b CLO (DsB))
	OPE	Yes I believe it is (Duplicated Answer 5b CLO (DsB))	Yes I believe it is (Duplicated Answer 5b CLO (DsB))	Yes I believe it is (Duplicated Answer 5b CLO (DsB))
5c Is belief in god important to vegetarianism? Mood +1	CLO	STOPaCLO	STOPaCLO	STOPaCLO
	GRD	STOPaGRD	STOPaGRD	STOPaGRD
	WILL	STOPaWILL	STOPaWILL	STOPaWILL
	OPE	STOPaOPE	STOPaOPE	STOPaOPE
5d If spirituality is an important aspect of vegetarianism, why aren't all religions based around this? Mood +1	CLO	STOPaCLO	STOPaCLO	STOPaCLO
	GRD	STOPaGRD	STOPaGRD	STOPaGRD
	WILL	STOPaWILL	STOPaWILL	STOPaWILL
	OPE	STOPaOPE	STOPaOPE	STOPaOPE
5e Do you believe in god? STOP INTERVIEW	CLO	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
	GRD	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
	WILL	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H

	OPE	STOP-CALL_T/H	STOP-CALL_T/H	STOP-CALL_T/H
6	<p>What is your view on the use of products produced from the by-products of animal processing?</p> <p>Book - OPE</p>	<p>6CLO_BILV</p> <p>All life is sacred. It is not only a matter of killing but also an issue of how animals are kept. So animal processing covers in my mind anything that is produced from animals under human control. Generally I avoid such products.</p>	<p>All life is sacred. It is not only a matter of killing but also an issue of how animals are kept. So animal processing covers in my mind anything that is produced from animals under human control. Generally I avoid such products.</p> <p>(Duplicated Answer 6 CLO (D&B))</p>	<p>All life is sacred. It is not only a matter of killing but also an issue of how animals are kept. So animal processing covers in my mind anything that is produced from animals under human control. Generally I avoid such products.</p> <p>(Duplicated Answer 6 CLO (D&B))</p>
	GRD	<p>6GRD_BILV</p> <p>It's not always clear where animal derivatives are part of a product. After all it's not in the best financial interests of a company manufacturing these products to disclose if they use derivatives. Did you know that fish oil is a part of many brands of margarine?</p>	<p>It's not always clear where animal derivatives are part of a product. After all it's not in the best financial interests of a company manufacturing these products to disclose if they use derivatives. Did you know that fish oil is a part of many brands of margarine?</p> <p>(Duplicated Answer 6 GRD (D&B))</p>	<p>It's not always clear where animal derivatives are part of a product. After all it's not in the best financial interests of a company manufacturing these products to disclose if they use derivatives. Did you know that fish oil is a part of many brands of margarine?</p> <p>(Duplicated Answer 6 GRD (D&B))</p>
	WILL	<p>6WILL_BILV</p> <p>I will not tolerate anyone professing to be vegetarian who wears or buys leather products.</p>	<p>I will not tolerate anyone professing to be vegetarian who wears or buys leather products.</p> <p>(Duplicated Answer 6 WILL (D&B))</p>	<p>I will not tolerate anyone professing to be vegetarian who wears or buys leather products.</p> <p>(Duplicated Answer 6 WILL (D&B))</p>
	OPE	<p>6OPE_BILV</p> <p>Eating or not eating meat is a life style choice for some. It is also a moral issue. It is wrong to eat the flesh of another living creature, so it's also wrong as far as I am concerned to wear its skin.</p>	<p>Eating or not eating meat is a life style choice for some. It is also a moral issue. It is wrong to eat the flesh of another living creature, so it's also wrong as far as I am concerned to wear its skin.</p> <p>(Duplicated Answer 6 OPE (D&B))</p>	<p>Eating or not eating meat is a life style choice for some. It is also a moral issue. It is wrong to eat the flesh of another living creature, so it's also wrong as far as I am concerned to wear its skin.</p> <p>(Duplicated Answer 6 OPE (D&B))</p>
6a	CLO	STOPaCLO	STOPaCLO	STOPaCLO
	GRD	STOPaGRD	STOPaGRD	STOPaGRD

	Mood +1	WILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL
		OPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE
6b	Do you own any leather products?	CLO	STOPaCLO	STOPaCLO	STOPaCLO	STOPaCLO	STOPaCLO	STOPaCLO	STOPaCLO	STOPaCLO
	Mood +1	GRD	STOPaGRD	STOPaGRD	STOPaGRD	STOPaGRD	STOPaGRD	STOPaGRD	STOPaGRD	STOPaGRD
		WILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL	STOPaWILL
		OPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE
6c	Do you own any leather goods?	CLO	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
	STOP INTERVIEW	GRD	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
		WILL	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
		OPE	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H	STOPaALL_T/H
7	What is the most difficult aspect of being a vegetarian? Life - OPE	CLO	7CLO_B	That question assumes there are difficulties. Well there are none. It's a healthy and above all moral life style. I have difficulty in understanding peoples persistence in eating meat given the facts. I cover many of these in my book 'To Die for'	7CLO_L	At first some years ago I would have said finding places to eat out. But this is no longer the case. The popularity and desire to have a healthy life has driven the emergence of establishments which cater for this need.	7CLO_V	Knowing the damage you have inflicted on your body as a meat eater, knowing that millions and millions of people are poisoning their children by feeding them the flesh of dead animals.		
		GRD	7GRD_BILV	If you approach vegetarianism as a process of giving up something you currently like and would therefore miss, then I can see how vegetarianism could be seen to having difficulties. It isn't like that.		If you approach vegetarianism as a process of giving up something you currently like and would therefore miss, then I can see how vegetarianism could be seen to having difficulties. It isn't like that.		If you approach vegetarianism as a process of giving up something you currently like and would therefore miss, then I can see how vegetarianism could be seen to having difficulties. It isn't like that.		
										(Duplicated Answer 7 GRD (DSB))

	WILL	7WILL_BIV	7WILL_L	
		I would have to say, the processed food industry. It is becoming increasingly difficult to ensure food items are animal free. But this type of problem is also true for diabetics and the increasing use of sugar by the food industry. So the problems not unique.	I'd like to say none. But it's always a problem finding good trustworthy eating establishments. More often than not vegetarian foods are included in an after thought. Omelettes, salads and such like.	I would have to say, the processed food industry. It is becoming increasingly difficult to ensure food items are animal free. But this type of problem is also true for diabetics and the increasing use of sugar by the food industry. So the problems not unique. (Duplicated Answer 7 WILL (D9B))
	OPE	7OPE_B Your sense of smell. It is so common now-a-days for fast food places to pump out the smell of cooking to supposedly entice their customers. The smell of cooked flesh repulses me, to the point of physical illness.	7OPE_L Finding good eating places while I am on one of my tours has always been a bit of a headache. Not so much in the UK it's more of an issue in the former eastern block countries, but it is getting better.	7OPE_V That question assumes there are difficulties. Well there are none. It's a healthy and above all moral life style. I have difficulty in understanding peoples persistence in eating meat given the facts.
7a	CLO GRD WILL OPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE
7b	CLO GRD WILL OPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE
7c	CLO GRD WILL OPE	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H

8	What are your views on animal rights activists? Vegi - WILL	CLO			
		GRD	8CLO_B Animal rights activism will always be controversial. I know I have had my fair share of controversy. There is a degree of commonality between what they do and what I also strive to communicate in my publications.	8CLO_LV I suppose we both have a common interest in animal welfare. But most animal rights activists don't go far enough. The right to life is fundamental, and this belief is not always shared. (Duplicated Answer & CLO (Dsl))	8CLO_LV I suppose we both have a common interest in animal welfare. But most animal rights activists don't go far enough. The right to life is fundamental, and this belief is not always shared. (Duplicated Answer & CLO (Dsl))
		WILL	8GRD_B We share a common interest but I can not align myself with activists or campaigns that take a hard line and with humane approaches to animal management and slaughter.	8GRD_LV It would be true to say our swords have crossed from time to time. Animal rights and vegetarianism are not the same thing. There are some common values but our beliefs are fundamentally different.	8GRD_LV It would be true to say our swords have crossed from time to time. Animal rights and vegetarianism are not the same thing. There are some common values but our beliefs are fundamentally different. (Duplicated Answer & GRD (Dsl))
		OPE	8WILL_B Each one of us must keep an open mind and above all listen to the arguments, even if they are distasteful. Animal rights has its place but in my view does not go far enough. All animals have a right to life.	8WILL_L There is no love lost between us. But it is important to distinguish our rights watch word is "human" mine is abstain. Is killing an animal in a humane way ok? Of course not.	8WILL_V I was criticised heavily and unjustly by them in my early days as a vegetarian activist. We share some common goals but, the right of animals to have a humane death is not one of them.
		OPE	8OPE_B We have not always seen eye to eye. This is well documented, which for the most part been has been fuelled by the media. I am not opposed to animal rights activism, so long as the fundamental right to life of ALL creatures is not ignored.	8OPE_LV Animal rights activism is high profile. For some the idea of liberating animals from laboratories, or battery farms is an exciting adventure. This type of excitement is also true for fox hunting demonstrations with the mass hysteria these often provoke. Vegetarianism is a life choice, not a hobby.	8OPE_LV Animal rights activism is high profile. For some the idea of liberating animals from laboratories, or battery farms is an exciting adventure. This type of excitement is also true for fox hunting demonstrations with the mass hysteria these often provoke. Vegetarianism is a life choice, not a hobby. (Duplicated Answer & OPE (Dsl))
8a	Were you surprised by the reaction of the animal rights campaigners at the Trafalgar Square hens incident? Mood +1	CLO	STOPaCLO	STOPaCLO	STOPaCLO
		GRD	STOPaGRD	STOPaGRD	STOPaGRD
		WILL	STOPaWILL	STOPaWILL	STOPaWILL

	OPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE	STOPaOPE
8b	Would you say your views mirrored by the criticism you received from the animal rights community? Mood +1	CLO GRD WILL OPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE
8c	But if you would allow me, I'd like to know if you are upset by the criticisms you get from the animal rights community? STOP INTERVIEW	CLO GRD WILL OPE	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H
9	Looking back over the past 20 years, what, in your view is the most significant event which has helped promote vegetarianism? Vegl - OPE	CLO GRD	9CLO_B 9GRD_B	9CLO_L 9GRD_L	9CLO_V 9GRD_V	9CLO_V 9GRD_V
			There is no one event that could be said to have popularised vegetarianism.	It would be nice to think that the world was that simple. It is an accumulation of fear within society, driven by BSE, CJD and Salmonella which has drawn attention to the benefits and relative safety vegetarianism brings.	Vegetarianism is not a religion there has been no one great event or one individual that can be pointed at or revered.	
			There is no one event. Society is changing because the power of publishing and broadcast media. The truth is being exposed. Meat consumption is dangerous.	I'd like to think I have done my part. I have dedicated my life's work to the promotion of vegetarianism. So I'd have to say it's not an event but a person.	The simple answer is there is none, but we all, or rather I should say we vegetarians, by example, play a part in the continuing popularity of vegetarianism.	

	WILL	SWILL_B/L/V There is a really strong sense of community amongst Vegetarians. So I would have to say that no one individual or event has singularly contributed to its growing popularity.	There is a really strong sense of community amongst Vegetarians. So I would have to say that no one individual or event has singularly contributed to its growing popularity. (Duplicated Answer 9 WILL (DSB))	There is a really strong sense of community amongst Vegetarians. So I would have to say that no one individual or event has singularly contributed to its growing popularity. (Duplicated Answer 9 WILL (DSB))
	OPE	9OPE_B There are a couple of publications which could be said to be significant but I would have to say with all sincerity that there really has been no one single document, event or person for whom I would give credit to.	9OPE_L I think that vegetarianism is best promoted through its practitioners, ambassadors so to speak. There are a lot of great people in the public eye who are themselves vegetarians.	9OPE_V There's not just one event but a series in the 60s and 90s. The salmonella egg scare, BSE and the whole GM debate has raised the awareness of people to the lethal harm humans cause through animal.
9a	CLO GRD WILL OPE	Would you say your involvement has been significant in advancing the popularity of vegetarianism? Mood +1	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE
9b	CLO GRD WILL OPE	Did the Trafalgar Square Hens incident help or hindered the vegetarian cause? Mood +1	STOPaCLO STOPaGRD STOPaWILL STOPaOPE	STOPaCLO STOPaGRD STOPaWILL STOPaOPE
9c	CLO GRD WILL OPE	How influential has your work been? STOP INTERVIEW	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H	STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H STOPaALL_T/H

10	Why did you become a vegetarian? Book - GAR	CLO	10CLO_BILV For a host of reasons far to complex to go into now.	For a host of reasons far to complex to go into now. (Duplicated Answer 10 CLO (DsB))	For a host of reasons far to complex to go into now. (Duplicated Answer 10 CLO (DsB))
		GRD	10GRD_B That's a simple question, but one which calls for a complex answer. It would take far too long to answer that question here.	10GRD_L Have you ever seen an animal killed?	10GRD_V Because it's the right thing to do. We don't need to kill animals to live.
		WILL	10WILL_B I get asked this frequently, so I will give you the same answer as I have given myself. Do you want to live a long and healthy life? Yes? Well then you know what to do.	10WILL_B Why on earth would you intentionally harm your body? Vegetarianism is not an option.	10WILL_V Yours maybe a simple question, but one which calls for a complex answer. It would take far too long to answer that question here.
		OPE	10OPE_B If you look at the facts, and I have covered these extensively throughout my publications. There simply is no choice to be made.	10OPE_L In life we must make choices. Vegetarianism is not one of them. If you want proof look at the data, eating meat is harmful.	10OPE_V If you take the time to look at the facts there is no other choice.
10a	What lead to make the decision to become a vegetarian? NO Mood CHANGE	CLO	STOPaCLO	STOPaCLO	STOPaCLO
		GRD	STOPaGRD	STOPaGRD	STOPaGRD
		WILL	STOPaWILL	STOPaWILL	STOPaWILL
		OPE	STOPaOPE	STOPaOPE	STOPaOPE
10b	In Open Eyes review of your recently released autobiography, it says, if you would allow me to paraphrase the	CLO	STOPbCLO	STOPbCLO	STOPbCLO
		GRD	STOPbGRD	STOPbGRD	STOPbGRD

<p>quote "Margaret does not discuss her conversion to vegetarianism, only time will tell if she will ever reveal her secret". Would you care to set the record straight once and for all why you became a vegetarian?</p> <p>Mood +1</p>	<p>WILL</p>	<p>STOPtoWILL</p>	<p>STOPtoWILL</p>	<p>10bWILLOPE_V (<i>Considers for a moment.</i>)</p> <p>Have you ever seen an animal slaughtered? Worse still have you ever seen animals waiting to be killed. Heard, no listened to them as they wait in line. I have. They prey. I have heard them. As sure as I have understood all your questions, I heard the words they utter as they await their fate.</p> <p>Now just think about it, who are they praying to?</p> <p>If they have a god, is it not also our god?</p> <p>Surely it's wrong to kill god's children. It must be wrong.</p>
	<p>OPE</p>	<p>STOPtoOPE</p>	<p>STOPtoOPE</p>	<p>Easter Egg (<i>Considers for a moment.</i>)</p> <p>Have you ever seen an animal slaughtered? Worse still have you ever seen animals waiting to be killed. Heard, no listened to them as they wait in line. I have. They prey. I have heard them. As sure as I have understood all your questions, I heard the words they utter as they await their fate.</p> <p>Now just think about it, who are they praying to?</p> <p>If they have a god, is it not also our god?</p> <p>Surely it's wrong to kill god's children. It must be wrong.</p>
<p>10c</p>	<p>CLO</p>	<p>STOPtoALL_T/H</p>	<p>STOPtoALL_T/H</p>	<p>STOPtoALL_T/H</p>

Script V1.0 - Recording Coach

Page 28 of 57

Are you sure you won't elaborate on this further? STOP INTERVIEW	GRD	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H
	WILL	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H
	OPE	STOPCALL_T/H	STOPCALL_T/H	STOPCALL_T/H

4.2

Stop Answers (Generic Follow-Up Answers)

Ref	Clip	Mood	Description
STOPaCLO	a	CLO	<p>Q: In Open Eyes review of your recently released autobiography, it says, if you would allow me to paraphrase the quote "Margaret does not discuss her conversion to vegetarianism, only time will tell if she will ever reveal her secret". Would you care to set the record straight once and for all why you became a vegetarian?</p>
STOPbCLO	b	CLO	
STOPaGRD	a	GRD	
STOPbGRD	b	GRD	
STOPaWILL	a	WILL	
STOPbWILL	b	WILL	
STOPaOPE	a	OPE	
STOPbOPE	b	OPE	
STOPcALL_T	c	ALL	
STOPcALL_H	c	ALL	

Lets move on. **Mood +1**

(Shack head) This is getting boring ask me a different question **Mood +1**

I have nothing to add **Mood +1**

It was going ok, you are doing yourself a disservice. move on. **Mood +1**

I've answered that question. Lets move on. **Mood +1**

Ask me another question **Mood +1**

You know I don't have anything to add to what I have already said. **Mood +1**

Ask me a different question **Mood +1**

I've had enough. This is ridiculous (Take off the mic and walk out)

This is a generic 3rd response for all Mood States. AND SHOT AT A DIFFERENT ANGLE

I've had enough. This is ridiculous (Walk out)

5.0

Interruption Responses (Using Assigned I Key)

Inter_T	Genuine Interruption Mood -1	Interviewer: Sorry could we stop a moment? The mic is picking up that noise! Margaret: Sure.Ok It seems to have stopped.	Activated by the interrupt key press when the interviewee is talking. (Maybe Jump to)
Inter_F	False Interruption Mood +1	Interviewer: Sorry could we stop a moment? Margaret: This surly isn't necessary. We don't have much time. (Look at watch)	

5.1

Interruption Responses (Pressing question or follow-up key while answer is being given)

Inter_O	Interruption Over Answer Mood +1	Margaret: You have asked me a question now let me answer it.	Activated by pressing any question or follow-up question key when the interviewee is talking.
---------	--	--	---

6.0

OPENING Sequence (Microphone Intro Set-Up)

Open_T	Tie mic	Hello. I see we are using a Tie mic. Here, let me put it on.	Walk in and either picks up the tie mic and puts it on or points to the mic on the table and instructs the interviewer on how to pick it up.
Open_H	Hand held mic	Hello. Ah I see, so you hold the mic by clicking on it and holding down with the left mouse button. Ok	

7.0

Between Questions Clips (body language Only)

Ref	Clip	Mood	Description
BET1	1	-	Look at watch
BET2	2	-	Look at 4 Points
BET3	3	-	

8.0 – Interface Scripts

8.1

Before you Start:

startQuest	Before you begin: To use recording coach you need to have with you headphones, a pen and some paper. Do you have these items?
startNum	In the space below please type your student number then click 'OK' to start.

8.2

Main Menu - Introduction

Page 32 of 57

Script V1.0 - Recording Coach

intro1	What does Recording Coach do?	Recording Coach is a Sound Recording and Interview Simulator, which has been developed to help improve individuals Sound Recording Skills. With the coach you will be able to practice setting up and using different sound kits, recording and conducting interviews and you will be able to take away copies of your interviews to use with the sound editing software.	VIDEO
intro2	Why use The Recording Coach?	Ever heard of the expression "Practice makes perfect". Well this programme is intended to provide you with an opportunity to explore and develop some initial sound recording skills before you go outside the class and undertake the recording assignment. Sound recording requires you to be able to multitask, (a bit like driving a car), practicing with the Recording Coach first will help to iron out some of the initial difficulties may people have and enable you to take advantage of real recording situations.	VIDEO
intro3	How do I control the recording coach?	Recording coach makes use of both the keyboard and mouse. Where ever you see the keyboard symbol, there's one on the hints pane above me, this indicates that the hints pane is controlled by pressing the 'H' key on the keyboard. What keyboard keys are active depends on which area of the recording Coach you are in. In the main area all activity is controlled use the mouse. So in this area you will for example use the mouse to click on menu buttons, pick up and hold the handheld the microphone, set up the Sound Kit and select interview questions.	VIDEO
intro4	Where should I start?	If you are using the coach for the first time then you have made a wise decision to start here with the introduction. But where you continue to is up to you. Some people may find the practice area useful to start off with before taking on a full assignment (Interview).	VIDEO

intro5	How do I conduct an Interview in Recording Coach?	<p>It varies depending on whether you have selected an assisted interview in the practice area or chosen to take an Assignment. However, generally in both, you will be asked to select 7 questions and place these in the order you initially intend to ask them.</p> <p>It is important at this point to write your selected questions down in the order you have arranged them because later during the interview when you want to ask question 4 on your list for example you will press the number '4' key on the keyboard.</p> <p>In the assisted interview the Sound kit setup and interview recording will be controlled for you.</p> <p>If however you have chosen to take an assignment you will also be asked to select the type of microphone you wish to use during the interview, set the kit up and then monitor and control the recording while to conducting the interview.</p>	VIDEO
intro6	In the interview, can I only ask the seven 7 questions I pre - selected?	<p>No, first off, the order you ask the questions is up to you. Even though you have ordered these you may wish to adjust the order or not ask a question. Each question is assigned to the number keys 1 to 7. These can be pressed in any order.</p> <p>It is possible also to ask follow-up probing questions when you feel your interviewee is holding back or has not given a satisfactory answer. These questions are formulated for you, and can be previewed on the hints pane if it's turned on. To ask the follow-up question you press the 'F' key on the keyboard.</p>	VIDEO
intro7	How do I end an Interview?	<p>Depending on how the interview is going Margaret may actually storm out and end the interview prematurely. But hey no, practice makes perfect. Outside of this happening it is your decision when to end the interview.</p> <p>The keyboard control to do this and other actions are listed at the bottom of the screen during the interview.</p>	VIDEO
intro8	Can I get a recording of the interview I conducted?	<p>Yes, at the end of the interview, Recording Coach records, the questions and follow-up questions you asked, and all answers given by your interviewee. It also notes if you caused any mic noise or recording distortion during the interview. Based on your performance it then presents a list of recordings of your to download take away and edit.</p>	VIDEO

Script V1.0 - Recording Coach

Page 34 of 57

intro9	Can I research my interviewee?	<p>Yes, I strongly advise you do. All the background information about Margaret can be found on the 'openeye' web pages. There is a link to the pages in the study support section at http://www.jim.org.uk.</p> <p>Read the information carefully, it a good idea to make notes. You never know you may be asked a question or two about what you have read.</p> <p>Will you be the one to get Margaret to reveal her secret?</p>	VIDEO
--------	--------------------------------	--	-------

8.3

Practice Menu - Demonstrate Sound kit Set-up			
Demo1	Before we Start	How to get back to practice menu.	The topics will be covered in a conversational style, akin to classroom delivery.
Demo2	Consumables	Batteries, Blank Mindisk	The Script is adlibbed.
Demo3	Headphones	How to wear them, and Why wear them, where to plug in to mindisk	VIDEO
Demo4	The Sound kit	Whats in the bag?	
Demo5	Mindisk recorder	Battery fitting, putting in a mindisk, set to record	
Demo6	Handheld Mic	Fitting a Battery, plug in to mindisk, turn on and handling	
Demo7	Tie Mic	Fitting a Battery, turn on and Plug in to mindisk, and placement	
Demo8	Recording tips	Keep Recording.	

8.4

Practice Menu - Practice Sound Kit Setup Information / Hints and Summary

ePracticeintro	<p>Practice Sound Kit Set-Up</p> <p>In a moment you will have a chance to set-up a sound kit yourself. If you have not watched the Demonstration then this may be advisable if you are unfamiliar with the equipment.</p> <p>On the next screen you will be asked to set up a hand held mic sound kit.</p> <p>You are asked to prepare yourself and the kit for an interview. This includes putting the mindisk recorder into record 'Rec' mode.</p> <p>Once you have set-up the kit you have an opportunity to review your performance.</p> <p>Press the 'C' keyboard key to continue</p>
phonesplug	The headphones need to be plugged in.
phones0	Wearing headphones enables you to monitor the recording. Monitoring allows you to hear if mic noise or distortion occurs.
phones1	It is a good idea when wearing headphones to leave one ear uncovered, like you have chosen to, to show your interviewee you are listening.
phones2	If you plan to wear headphones over both ears then this could make your interviewee uncomfortable. They could get the impression that you are not listening.
Lmic	

		There are one or more issues with the mic. Is the mic plugged-in? Powered with a battery? Is it switched on?	
Lmd		The Minidisk recorder was not put in record mode. To put the Minidisk recorder into record mode you must first power the recorder by inserting a battery. You also need to insert a blank disk. Once these are in place, press the 'REC' button on the recorder."	
whatnext		How about trying an assisted interview or of course if you feel you are ready take a 'Full Assignment' which can be accessed via the 'Main Menu'.	
great		Great! The kits set-up.	
1thing		Just one thing.	
try		To try setting-up the Sound Kit again press the 'S' key to go back to the Kit Set-Up screen."	
adjust		To adjust the kit set-up Press the 'S' keyboard key to go back to the Kit Set-Up screen."	
enough		However if you wish to leave the Sound Kit Set-up, open the 'Control Panel' by pressing 'P' on the keyboard."	

8.5

Practice Menu - Take an Assisted Interview

Prac1	In a moment you will conduct a very short interview with one of my colleagues. I'll sit in on the interview and guide you through the process. You will have the opportunity to ask a couple of questions. So it's important that you	VIDEO
-------	--	--------------

	<p>note both of these down on some paper so you can refer to them during the interview.</p> <p>To ask each question you will need to press the corresponding keyboard keys '1' for question one and '2' for question two. However you can ask the questions in any order, it's up to you.</p> <p>Once you have made a note of the two questions on the post it notes, press the 'C' keyboard key to continue.</p>
Prac2	<p>Select the type of Microphone you wish to use.</p>
Prac3	<p>Ok, we're nearly there. The sound kit in this assisted interview will be set-up for you.</p> <p>During the interview Recording Coach will reproduce the sound as if you are monitoring recording by wearing headphones over one ear.</p> <p>I will sit behind you and guide you through the interview. Take it nice and slow after all remember you only have two primary questions.</p> <p>When you are ready to start press the 'C' keyboard key to continue.</p> <p>VIDEO</p>

8.6 - Assisted Interview

8.6.1

<p>Hand Mic Guidance</p>	
hmg_1	<p>Let me move over this side so you can hear me better.</p> <p>Ok.</p> <p>Have a look at the minidisk recorder. Its clearly 'On' and recording, good. Pick the microphone up off the table and move it around.</p>

	<p>Notice that moving the mic too quickly can cause mic noise. Holding a real mic too tightly or moving it in your hand can cause similar noise.</p> <p>Likewise putting the mic too close to you or your interviewee can result in a distorted recording.</p> <p>Both mic noise and distortion will only be heard if you monitor your recording by wearing headphones. In this instance you can hear what the mic picks up in your right ear only.</p> <p>You will need to find the best place to hold the microphone to avoid distortion and maximise recording level.</p> <p>Try asking one of the questions. Either one, its your choice.</p>	
hmg_2	<p>It's important to listen to your interviewees answer. You will have a number of questions to ask, but also you should try to come up with questions in response to your interviewees answers during the interview.</p> <p>In the hints pane above you can see a possible follow-up question. You now need to decide if you want to continue asking questions around this first topic by asking this follow-up question, or ask the second question you wrote down earlier. You could even repeat the first question again if you feel you need to.</p> <p>Anyway, I'll shut-up now and leave you to it. When your finished press the 'R' key to round the interview up.</p> <p>I'll talk to you again when you're done.</p>	
hmg_SUM	<p>Using the hand held microphone for the interview</p> <p>Each microphone has its pro's and con's.</p> <p>Hand held mics are more challenging to use but provide a higher degree of flexibility than tie mics.</p> <p>Handling a hand held mic incorrectly can generate noise. This noise can be picked-</p>	<p>VIDEO</p>

	<p>up during the recording.</p> <p>Correctly placing the mic is very important. Too close to the interviewee or interviewer and you will get distortion, or piping, where the speakers breath buffets the mic casing.</p> <p>Hand mics are also susceptible to background sound.</p> <p>Having said this, if you monitor you recording by wearing headphone you will be able to identify and correct any of these problems during a recording.</p> <p>So how about trying a full unassisted assignment now.</p> <p>You'll interview is Margaret Weatherby. She's a woman with a big secret. I wonder can you get her to reveal it?</p> <p>Go to the main menu and click on 'Take an Assignment'.</p> <p>Press 'P' to open the control panel to access both the main and practice menus.</p>	
--	---	--

8.6.2

The Mic Guidance

<p>tmg_1</p>	<p>Let me move over this side so you can hear me better. Ok The mindisk recorder clearly 'On' and recording. The mic will be heard in your right ear.</p> <p>Make sure your interviewee does not rub, knock or cover the mic while they are talking. If he does interrupt him. You can do this by pressing the I key.</p> <p>Try asking one of the questions. Either one its your choice.</p>	
<p>tmg_2</p>	<p>It's important to listen to your interviewees answer. You will have a number questions to ask, but also you should try to come up with questions in response to your interviewees answers during the interview.</p>	

	<p>In the hints pane above you can see a possible follow-up question. You now need to decide if you want to continue asking questions around this first topic by asking this follow-up question, or ask the second question you wrote down earlier. You could even repeat the first question again if you feel you need to.</p> <p>Anyway, I'll shut-up now and leave you to it. When your finished press the 'R' key to round the interview up.</p> <p>I'll talk to you again when you're done.</p>	
tmg_3	<p>Great you picked up the interference and paused the interview. You can now repeat the question, to get a clear recording of their answer.</p>	
tmg_SUM	<p>Using the tie microphone for the interview</p> <p>There are pro's and con'ts with using each type of microphone.</p> <p>If well placed, the tie mic is good for picking up the voice of your interviewee as well as minimising problems associated with background noise. But watch out for noise from cloth rustle or jewellery.</p> <p>However a tie mic does limit you options. For example the mic will not pick-up the questions you ask. Given that one of the keys to a good interview is the ability to listen and respond to the answers your interviewee gives, you may find that you end up with a recording that doesn't make much sense because you only get one side of the conversation.</p> <p>Monitoring the interview by wearing headphones is so important. Monitoring enables you to pick up any problems with the recording as they happen.</p> <p>So how about trying a full unassisted assignment now?</p> <p>You'll interview a lady by the name of Margaret Weatherby. She has a big secret. Can you get her to reveal it?</p> <p>Go to the main menu and click on take an assignment.</p>	<p>VIDEO</p>

	<i>Press 'P' to open the control panel and access the main and practice menu</i>
--	--

8.7

Assisted interview Primary and Follow-up Questions and First and Follow-up Answers

<p>The opening question selected by the student will determine the stream of questioning and MOOD</p>		<p>There are 12 responses to each primary question.</p>	
	Primary and Follow-up Questions	Mood	First Answers (Follow-ups)
1	If you could be granted one wish, what would it be?	CLO 1CLO_F GRD 1GRD_F WILL 1WILL_F OPE 1OPE_F	
1a	Why this wish?	CLO 1aCLO_F GRD 1aGRD_F WILL 1aWILL_F OPE 1aOPE_F	
1b	Do you think your wish will ever come true?	CLO 1bCLO_F GRD 1bGRD_F WILL 1bWILL_F	

		OPE	1bOPE_F	
1c	Have any of your wishes ever come true? Mood +1	CLO	STOPfar1	"Ask me something else"
		GRD	STOPfar1	
		WILL	STOPfar1	
		OPE	STOPfar1	
1d	What are your views on wishing? Mood +1	CLO	STOPfar2	"Lets move on"
		GRD	STOPfar2	
		WILL	STOPfar2	
		OPE	STOPfar2	
1e	Is wishing harmful? Mood +1	CLO	STOPfar3	"Sorry we have run out of time, I need to get on." (Look at watch)
		GRD	STOPfar3	
		WILL	STOPfar3	
		OPE	STOPfar3	
2T	TIE VERSION Can you tell me a little about your self?	CLO	2ICLO_F	
		GRD	2IGRD_F	
		WILL	2IWILL_F	
		OPE	2IOPE_F	
2R	REPEAT QUESTION (Both) Can you tell me a little about your self?	CLO	2rCLO_F	
		GRD	2rGRD_F	

	Mood -1	WILL OPE	2aWILL_F 2aOPE_F	
2a	What drives you to do what you do?	CLO GRD WILL OPE	2aCLO_F 3aGRD_F 2aWILL_F 2aOPE_F	
2b	What are you doing now?	CLO GRD WILL OPE	2bCLO_F 2bGRD_F 2bWILL_F 2bOPE_F	
2c	Have you been doing this for a long time? Mood +1	CLO GRD WILL OPE	STOPfar1 STOPfar1 STOPfar1 STOPfar1	
2d	Would you rather be doing something else? Mood +1	CLO GRD WILL OPE	STOPfar2 STOPfar2 STOPfar2 STOPfar2	
2e	Do you get bored easily? STOP INTERVIEW	CLO GRD WILL	STOPfar3 STOPfar3 STOPfar3	

Script V1.0 - Recording Coach

Page 44 of 57

	OPE	STOPfar3	
Introduction HAND		Intro_F_H	So you want to ask me a couple of questions. Ok fire away.
Introduction TIE		Intro_F_T	I have put the tie mic on, if that's ok. So you want to ask me a couple of questions. Ok fire away.
Interrupt TRUE Can we stop a moment the microphone is picking up the noise your hand is making on your top.		Inter_F_Y	Ok. Sorry.
Interrupt FALSE Sorry can we stop a moment.		Inter_F_N	Really, we need to stop in a couple of minutes.

9.0 Assignment

9.1

Main Menu - Take an Assignment - Assignment Preparation	
ainfo	<p>Before you begin:</p> <p>To prepare for an interview it is a good idea to think about the questions you intend to ask and the structure or order of the questions.</p> <p>On the next screen you will be given a number of questions to consider.</p> <p>From this range you must select 7 questions and arrange these in the order in which you anticipate asking them.</p>

		<p>It is important that you write down on paper each of the questions you select as well as the order in which you place them. This written list will be the only reference to the questions you will have during the interview!</p> <p>To continue to the next stage press the 'C' key on your keyboard to continue.</p>	
aQselect	Select Questions.	Select 7 of the questions written on the sticky-notes below and drag each to the white board placing them in the order you think they might best be asked.	
aPrepwrite	Interview Preparation	<p>Interview Preparation:</p> <p>During the interview you can choose to ask either some or ALL of the questions you have selected here.</p> <p>To ask a question you will need to press the corresponding keyboard number key (from 1 to 7). So for example, to ask question 2, during the interview you will press keyboard number-key '2'. Remember, even though you have ordered the questions here, you can ask your questions in any order.</p> <p>So that you remember your questions and their associated keyboard number WRITE each one down on some paper in the order you have arranged them here.</p> <p>If you are NOT ready to continue and want to re-arrange or swap one or more questions, drag a question OFF the board.</p>	

Script V1.0 - Recording Coach

Page 46 of 57

		When you are happy, press the 'C' key on the keyboard to continue.	
aWhichmic	Which Mic?	Now you need to select the type of microphone you would like to use to record the interview with.	
aBefore1		<p>A couple of things before you leave for the interview: (1 of 3)</p> <p>In a moment you will be transported to the Elmore Docks Cafe for your 2.00pm appointment with Margaret Weatherby.</p> <p>But before you leave, here are a couple of pointers to get you started.</p> <p>When you arrive at the cafe you will first need to set-up your sound kit.</p> <p>Don't forget to put the Minidisk recorder into record mode.</p> <p>After you have set the sound kit up Margaret will arrive to begin the interview.</p> <p>If you have selected to record the interview with a hand held mic, you will need to pick the microphone up off the table. (To do this click and hold down the left mouse button over the microphone). <i>Picking-up and putting down the hand held mic as well as moving the handheld mic around too much will create mic noise.</i></p> <p>Remember to keep the headphones you are wearing on and covering both ears. Based on the way you choose to wear headphones during the sound Kit set-up</p>	

		<p>Recording Coach will actually simulate what you would hear. (if for example, you chose to monitor your recording with one ear uncovered)</p> <p>Press the 'C' key to continue</p>	
<p>aBefore2</p>		<p>A couple of things before you leave for the interview: (2 of 3)</p> <p>Below is an example of the commands available to you during the interview.</p> <p>Follow-up Questions</p> <p>In addition to asking the questions you have just chosen, you can also ask follow-up or probing questions should you feel your interviewee has not answered you question or is being evasive. Follow-up questions are previewed in the 'Hints Pane' above (if turned on). To ask the follow-up question previewed, wait for your interviewee to finish answering your initial question, then press the 'F' keyboard key.</p> <p>Interrupt or Pause</p> <p>If your microphone picks up external noise or you want to adjust your sound kit setup press the 'I' key to interrupt and pause the interview. To continue with the interview ask or repeat a question.</p> <p>Adjust Sound Kit Set-Up</p> <p>To adjust the sound kit (for example to change the way you wear the headphones) press the 'S' key.</p> <p>Press the 'C' key to continue</p> <p>A couple of things before you leave for the interview: (3 of 3)</p>	
<p>aBefore3</p>			

		<p>Ending the Interview You can end an interview at any point, by pressing the 'R' keyboard key. Ending the interview this way will give you access to a copy of your recorded interview.</p> <p>Alternatively if you wish to just quit, without a copy of the recording, open the Control Panel and select 'Quit' or 'Main Menu'.</p> <p>Should you wish to jog your memory about the information covered here, you can find a summary in the Control Panel.</p> <p>Finally... Good Luck! Don't let your interviewee get the better of you.</p> <p>Press the 'C' key now to leave for the interview</p>	
--	--	--	--

9.2

Full Assignment - Conclusion	
COM_Record	<p>You managed to complete the interview without Margaret walking out. Well Done!</p> <p>You set the sound kit up correctly and put the mindisk recorder into record mode so you WILL be able to access a recording of your interview on the Student Zone 'D' drive.</p> <p>The file has been named using the student number you were asked to input when you started Recording Coach.</p>

		<p>For example: '12345678.wav'. If you neglected to input anything, then the name used is "interview.wav"</p> <p>NOTE: The sound file will only be an accurate recording if you chose to put headphones on in the equipment set-up at the start of the interview. This is because of the way the sound file is created by Recording Coach. It is possible therefore that the recording will not include all the sounds, noise and distortion you encountered during the interview.</p> <p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian? If not here's a couple of pointers. Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these. Margaret will only reveal her secret if she's in a good mood. Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either. Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts. Access the Control Panel to return to the Main Menu and try</p>	
--	--	--	--

COM_MD		again!	
<p>You managed to complete the interview without Margaret walking out. Well Done!</p> <p>Interview Recording You did not manage to correctly set up the sound kit. Because of this you do not have a recording of the interview.</p> <p>For your information it appears the issue was with the MiniDisc. It could be that you did not insert the battery or blank MiniDisc or you may have not put the MD in record mode.</p> <p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian? If not here's a couple of pointers.</p> <p>Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these.</p> <p>Margaret will only reveal her secret if she's in a good mood.</p> <p>Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p><i>Access the Control Panel to return to the Main Menu and try again!</i></p>			

COM_MIC		<p>You managed to complete the interview without Margaret walking out. Well Done!</p> <p>Interview Recording You did not manage to correctly set up the sound kit. Because of this you do not have a recording of the interview.</p> <p>For your information it appears the issue was with the Microphone. It could be that you did not insert the battery or switch the microphone on or plug the microphone into the minidisc recorder.</p> <p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian? If not here's a couple of pointers.</p> <p>Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these.</p> <p>Margaret will only reveal her secret if she's in a good mood.</p> <p>Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p><i>Access the Control Panel to return to the Main Menu and try again!</i></p>	
COM_MnR		<p>You managed to complete the interview without Margaret walking out. Well Done!</p>	

		<p>Interview Recording You did not manage to correctly set up the sound kit. Because of this you do not have a recording of the interview.</p> <p>For your information it appears the issue was with both the Microphone and Minidisc recorder.</p> <p>It could be that you did not insert the batteries or blank MD or microphone plug into the recorder. Or it may be you did not switch on the microphone or put the minidisc recorder into record mode.</p> <p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian?</p> <p>If not here's a couple of pointers.</p> <p>Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these.</p> <p>Margaret will only reveal her secret if she's in a good mood.</p> <p>Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p><i>Access the Control Panel to return to the Main Menu and try again!</i></p>	
WC_Record		<p>So Margaret Walked Out. Not a great start but you could always go back and nail the interview a second time.</p>	

		<p>Interview Recording You set the sound kit up correctly and put the minidisk recorder into record mode so you WILL be able to access a recording of your interview on the Student Zone 'D' drive.</p> <p>The file has been named using the student number you were asked to input when you started Recording Coach.</p> <p>For example: '12345678.wav'.</p> <p>If you neglected to input anything, then the name used is "interview.wav"</p> <p>NOTE: The sound file will only be an accurate recording if you chose to put headphones on in the equipment set-up at the start of the interview. This is because of the way the sound file is created by Recording Coach. It is possible therefore that the recording will not include all the sounds, noise and distortion you encountered during the interview.</p>	
	<p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian?</p> <p>If not here's a couple of pointers.</p> <p>Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these.</p> <p>Margaret will only reveal her secret if she's in a good mood.</p>		

		<p>Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p><i>Access the Control Panel to return to the Main Menu and try again!</i></p>	
<p>WO_MD</p>		<p>So Margaret Walked Out Not a great start but you could always go back and nail the interview a second time.</p> <p>Interview Recording You did not manage to correctly set up the sound kit. Because of this you do not have a recording of the interview.</p> <p>For your information it appears the issue was with the MiniDisc. It could be that you did not insert the battery or blank MiniDisc or you may have not put the MD in record mode.</p> <p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian? If not here's a couple of pointers. Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these.</p>	

		<p>Margaret will only reveal her secret if she's in a good mood. Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p><i>Access the Control Panel to return to the Main Menu and try again!</i></p>	
<p>WO_MIC</p>		<p>So Margaret Walked Out Not a great start but you could always go back and nail the interview a second time.</p> <p>Interview Recording You did not manage to correctly set up the sound kit. Because of this you do not have a recording of the interview.</p> <p>For your information it appears the issue was with the Microphone. It could be that you did not insert the battery or switch the microphone on or plug the microphone into the minidisc recorder.</p> <p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian? If not here's a couple of pointers.</p> <p>Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these.</p> <p>Margaret will only reveal her secret if she's in a good mood.</p>	

<p>Script V1.0 - Recording Coach</p>	<p>Page 56 of 57</p>	<p>Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p>Access the <i>Control Panel</i> to return to the <i>Main Menu</i> and try again!</p> <p>So Margaret Walked Out. Not a great start but you could always go back and nail the interview a second time.</p> <p>Interview Recording You did not manage to correctly set up the sound kit. Because of this you do not have a recording of the interview.</p> <p>For your information it appears the issue was with both the Microphone and Minidisc recorder.</p> <p>It could be that you did not insert the batteries or blank MD or microphone plug into the recorder. Or it may be you did not switch on the microphone or put the minidisc recorder into record mode.</p> <p>The Secret? So did you manage to get Margaret to reveal her secret and tell you why she became a vegetarian? If not here's a couple of pointers.</p> <p>Whether Margaret reveals her secret is based on the questions you select and importantly the order in which you initially arrange these.</p>
<p>WO_MnR</p>		

		<p>Margaret will only reveal her secret if she's in a good mood.</p> <p>Waving the mic under her nose will not make her happy. Asking questions when she clearly wants to move on, may not always be the appropriate way to bring her around either.</p> <p>Can you be the first this semester to get a recording of Margaret revealing her secret? If you think you are the first contact Jim with a copy of your interview recording of Margaret spilling her guts.</p> <p><i>Access the Control Panel to return to the Main Menu and try again!</i></p>	
--	--	---	--

9.3

WALKOUT Video - ALL 3 Streams

WOUT_1	(Shout!) Oh, bad luck. True to form she's walked out on you. Press the 'R' key to round-up and retrieve your interview recording. (Yes I'm coming)	VIDEO
WOUT_2	She's walked out, has she? Not to worry. Press the 'R' key to round-up and retrieve your interview recording.	VIDEO
WOUT_R	Seriously, she's not coming back. You are going to need to book another appointment if you want to interview her some more. By the way did you get her to reveal her secret? No? Press the 'R' key to round-up.	VIDEO

Element 6 - User testing group June trials testing plan

Jim Davis

Thank you for agreeing to take part in this preliminary evaluation of my programme.

Just a brief note before we start.

As I am sure most of you are aware, it is the programme which is being evaluated and not your performance. If you get stuck at any time please ask for assistance. It may be that I have badly worded an instruction or task, or that the programme has failed to work correctly.

EVERY opinion, thought, comment, observation and criticism is eagerly sought. I am not interested in how good it is. I am interested in what's wrong, missing, confusing or just down right ugly.

Using this document:

It is important that you do not turn over each page until instructed to do so. In some instances this instruction will come from me, in other instances you will be told to turn over the page when you have completed a task in the text of this document.

In all instances once you have turned over the page you can not go back to a previous page to view change or add information.

If you would like to scribble notes on these pages please feel free to do so.

**DO NOT TURN
OVER THIS PAGE!**

Version 1 - 23/05/05
Page 1 of 8

Jim Davis

Just making sure there's no peeking

Please turn over to the next page now.

Version 1 - 23/05/05
Page 2 of 8

Jim Davis

Prototype - a preliminary review.
 UTG Session June 1st 2005.

Last Name:																					First Name:																				
Student ID No:																					Level (year):	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3																	

1:0) Do you have any existing knowledge of the item you have been asked to look at today?

No Yes (If you answer Yes could you give a very brief outline of what you know about the item in this space)

2:0) In a moment I would like you to have a look at the programme and answer the questions below.

DO NOT access the 'TAKE AN ASSIGNMENT' portion of the programme. You may however access all other areas of the programme to locate answers to the following questions.

You will have a maximum of 10 minutes to answer these questions.

2:1) In the Introduction, you are told where to access background information about your intended interviewee.

Please indicate the location here:

Where is the background information held?

2:2) What are the brand(s) of battery used in the demonstration?

The battery brand/s are _____

2:3) In the 'Practice Sound Kit Set-up' - what choices relating to the use of the headphones are available?

Choose not to wear Headphones Choose to wear covering only one ear

Choose to wear covering both ears Choose an alternative type of headphone

Other (Please specify) _____

Please do not turn the page over until instructed to do so.

Jim Davis

3:0) Have you studied the module DM 1006 Introduction to Digital Sound?	<input type="checkbox"/> No	<input type="checkbox"/> Yes
---	-----------------------------	------------------------------

4:0) Again I would like you in a moment to attempt to **'TAKE AN ASSIGNMENT'**.
But before you do PLEASE NOTE: Not all the programme is functioning in this section.
To avoid any added confusion this may bring, please follow these initial instructions very carefully.

STEP 1

Select 'Take An Assignment' and follow the on-screen instructions UNTIL you reach a screen with a White Board and group of 'Post-it Notes'.
(Then read step 2 below)

STEP 2

For your fist question select:
"How long have you been a vegetarian?"
All other questions and their order are your choice.
(Now read step 3 below)

STEP 3

Follow the on screen instructions until you are asked to select a microphone type :
Select a hand held microphone.
(Now read step 4 below)

STEP 4

Please turn over this page now to access further instructions.

Please do not turn the page over until instructed to do so.

Jim Davis

5:0) Before you continue any further, please answer the following questions.

5:1) Who are you about to interview? _____

5:2) Where is the interview going to take place? _____

6:0) Once you have answered the questions above follow the on-screen instructions until you reach the interview location, then stop and turn over this page.

Jim Davis

7:0) The interview you will shortly conduct is likely to be quite brief. You will only have the opportunity to ask questions based on the first question you previously selected and placed on the white board.

You will have 10 Minutes to complete the task below.

Please start NOW.

7:1) Your goal is to successfully conduct, record and conclude an interview. Your aim is to get your interviewee to reveal the actual number of years she has been a vegetarian.

You may attempt the interview as many times as you like but you **MUST NOT** exit/quit the programme to do so.

You will be informed when your time is up.

Please do not turn the page over until instructed to do so.

Jim Davis

8:0) Now quit / exit the programme.

8:1) Locate the recording of your interview and listen to it.

8:1) Were you able to locate the recording of your interview?

Yes No

9:1) In the interview/s did you get Margaret to reveal how many years she has been a vegetarian?

No Yes

9:2) If you answered yes to the above question, how many years has Margaret been a vegetarian?

_____ years

9:3) How many interviews did you attempt?

_____ interviews

10:0) Did the programme crash or stop functioning at any time?

No Yes

10:1) If the answer to the above question is yes, can you recall then this happened? (Please indicate this if you can in the space provided below).

Please do not turn the page over until instructed to do so.

Element 7 - RecordingCoach walkthrough

What follows is a walkthrough of RecordingCoach. The walkthrough is by no means definitive. The route taken highlights some of the issues, decisions and features discussed in chapter 5 as well as a number which are not.

While not essential, ideally the walkthrough should be undertaken using RecordingCoach, as such instructions to the reader are provided along side screen shots. Instructions are *italicised* and preceded by (!).

Technical note

To ensure the operational performance of RecordingCoach, the programme must reside on the hard drive of the host computer and be able to write the 'C' drive. Instructions are provided under Element 8 page340 and also included on the accompanying CD-ROM containing RecordingCoach (Element 9, page 342).

Start and loading and verification

During the loading process RecordingCoach retrieves an activation key from a web site. Central control of the activation key enables the administration of RecordingCoach on all host computers. This function was included to ensure that RecordingCoach can only be accessed during the field trials and at designated times. Additionally during the load sequence RecordingCoach manipulates the computer system's audio settings ensuring that sound is turned on and that the volume is at an audible level.

Figure 87 RecordingCoach - loading screen.



The screen prompts ensure that students have the appropriate tools (pen, paper and headphones) to work through RecordingCoach unhindered.

Figure 88 RecordingCoach - pen, paper and headphones prompt.



(!) Use the mouse to click the 'Yes' button.

As previously discussed the student number is used to name the individual sound files generated as part of the simulated interview. Additionally, the student number is used to identify and document usage patterns.

Figure 89 RecordingCoach - user name input.



(!) Using the keyboard, type your first name and click the 'OK' button.

The main menu and introduction

The first time the user accesses the main menu both the hints pane (top left) and audio dialogue guide the user to the introduction.

Figure 90 RecordingCoach - main menu.

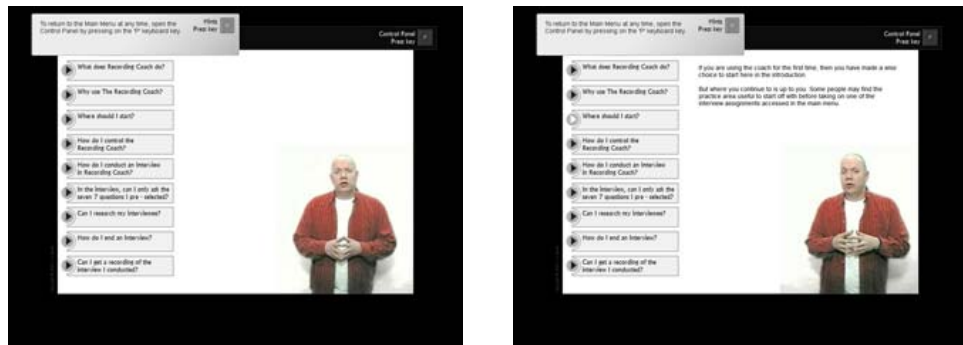


Main Menu
 Introduction
 Practice Tasks
 Take An Assignment

(!) Using the mouse, click on 'Introduction'.

The introduction offers nine questions and answers which are delivered by the on-screen, virtual coach. This character is used throughout RecordingCoach to introduce and discuss concepts, ideas and practices and provide user performance feedback. In some instances, the coach is represented through the use of video in others his voice is used to narrate on screen text. The hints pane, top left, prompts the user on how to navigate back to the main menu.

Figure 91 RecordingCoach - introduction.



(!) Press 'P' on the keyboard to open the control panel.

The control panel

The control panel houses centralised help as indicated in the three tabs to the left. It is also the location for the further manipulation of sound controls in terms of volume and the enabling or disabling of global text narration. The need for this latter feature emerged from the usability testing.

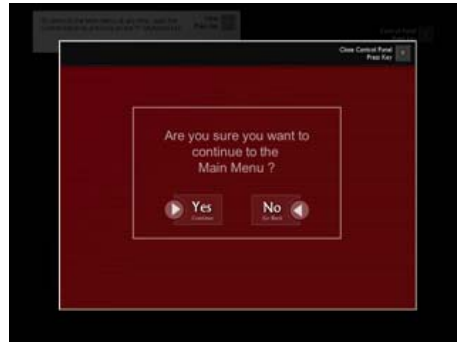
Figure 92 RecordingCoach - control panel.



(!) Using the mouse, click on 'Main Menu'.

The control panel is a feature accessible throughout RecordingCoach. Opening and closing the control panel is controlled by pressing the 'P' key. Confirmation messages are used to ensure that the user wishes to navigate elsewhere rather than close the pane.

Figure 93 RecordingCoach - main menu confirmation.



(!) Use the mouse to click 'Yes'.

Figure 94 RecordingCoach - main menu return.



(!) Use the mouse to click 'Practice Tasks' to go to the practice submenu.

The practice sub-menu and sound kit demo

The practice submenu is divided into three sections.

Figure 95 RecordingCoach - practice sub menu.



Practice Menu
 Sound Kit Set-up Demo
 Practice Sound Kit Set-up
 Try An Assisted Interview

(!) Use the mouse to click on 'Sound Kit Set-up Demo'

The sound kit demonstration consists of six sections, which can be played independently or collectively by using the mouse to select 'Play All'.

Figure 96 RecordingCoach - sound kit demonstration.



(!) Use the mouse to select 'Play All'.

The original intention in this section was to deliver the demonstration using two synchronised videos. The first video would portray the coach sitting at the table. The second would be a close-up of the table and the coach's hands, which will enable the user to observe in more detail the kit being set up. This was not fully realised because of difficulties encountered with the video equipment and consequently the footage obtained. Salvaged from the footage were a number of stills which were used in place of the intended live action.

Figure 97 RecordingCoach - sound kit demonstration dual images.



(!) Press the 'P' keyboard key to open the control panel.

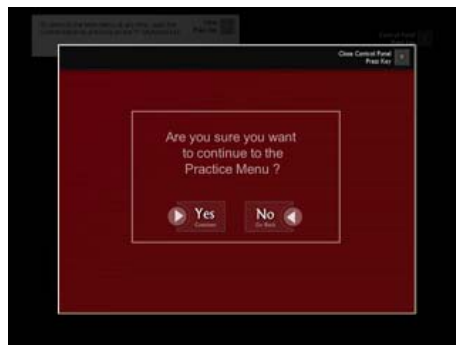
Notice the presence of the practice menu button (see Figure 92 for a comparison). The practice menu option appears in the control panel when the user is in the practice sub menu area.

Figure 98 RecordingCoach - control panel with practice menu navigation button.



(!) Use the mouse to click on the practice menu button.

Figure 99 RecordingCoach - practice menu confirmation.



(!) Click 'Yes' to confirm your return to the practice menu.

Sound kit set-up

Figure 100 RecordingCoach - practice menu return.



(!) In the practice menu, use the mouse now to select practice sound kit set-up.

Throughout RecordingCoach, narration of on-screen text can be controlled by using the mouse to click on the stop and play/pause buttons.

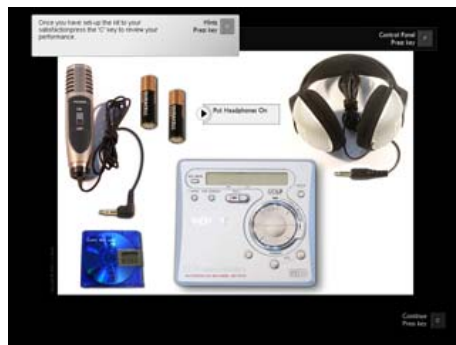
Figure 101 RecordingCoach - sound kit set-up introduction.



(!) Press the 'C' keyboard key to continue.

The sound kit set-up employs drag-and-drop behaviour to support user interaction with the on-screen sound kit.

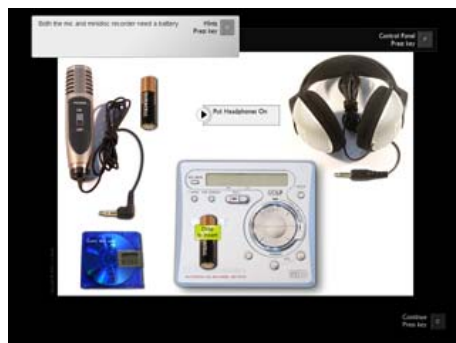
Figure 102 RecordingCoach - sound kit set-up starting point.



(!) Click and hold down the left mouse button on one of the batteries. Drag this over the minidisk recorder and release the mouse button.

Notice the hints pane suggests that the microphone also needs a battery.

Figure 103 RecordingCoach - sound kit set-up the first battery.



Hints pane

Both the mic and minidisk recorder need batteries

(!) Drag and release the remaining battery over the top of the microphone.

Figure 104 RecordingCoach - sound kit set-up the second battery.



Note also that the minidisk recorder display now shows battery power

(!) Drag and release the minidisk over the top of the minidisk recorder (Not shown here).

(!) Drag, the headphone jack plug, over the minidisk recorder and keep the mouse button pressed.

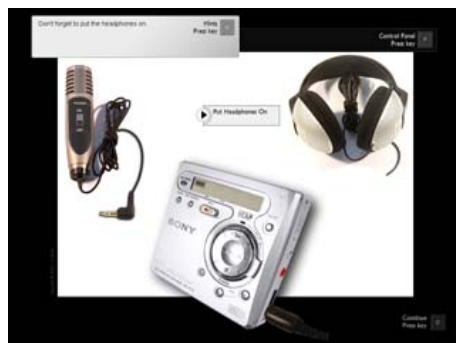
The minidisk swivels to show three input/output sockets.

Figure 105 RecordingCoach - sound kit set-up the headphone plugged in part one.



(!) Move the tip of the jack plug over the bottom most sockets of the minidisk recorder, when the jack plug is correctly aligned, it will appear to have been inserted into the socket. At this point release the mouse button.

Figure 106 RecordingCoach - sound kit set-up the headphone plugged in, part two.



(!) Repeat the activity, this time with the microphone jack plug, placing the tip of the microphone jack plug over the red sockets and release the mouse (not illustrated here).

(!) Click on the button in the middle of the table entitled 'Put Headphones On'.

Figure 107 RecordingCoach - sound kit set-up the headphone and microphone are plugged in.



(!) On a floating window that opens, select one or other of the methods for wearing headphones.

Figure 108 RecordingCoach - sound kit set-up the headphone monitoring selection (how to wear the headphones).



How do you intend to wear the headphones?

- One ear uncovered
- Both ears covered

The equipment can be set up in any order. Headphones can be taken off and put on. Hints are provided throughout the exercise on the hints pane.

(!) Press the 'C' keyboard key to continue.

Figure 109 RecordingCoach - sound kit set-up activity feedback.

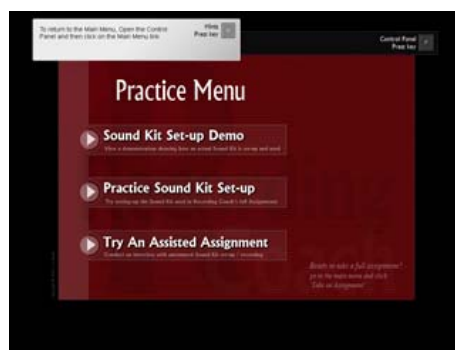


The screen provides feedback based on the users performance in the equipment set up. In this instance we neglected to turn on the microphone or place the minidisk recorder into record mode. Depending on choice of wearing headphones, the user may have been praised for keeping one ear uncovered or this may have been suggested. From the review the user is able to go back make adjustments to the sound kit set-up and receive further feedback.

(!) *Open the control panel and navigate back to the practice menu (not illustrated here).*

The assisted assignment and the 60 second timer

Figure 110 RecordingCoach - practice menu.



(!) *From the practice menu select 'Try an Assisted Assignment'.*

The opening screen of the assisted interview introduces the mechanism for noting down and asking questions, within RecordingCoach.

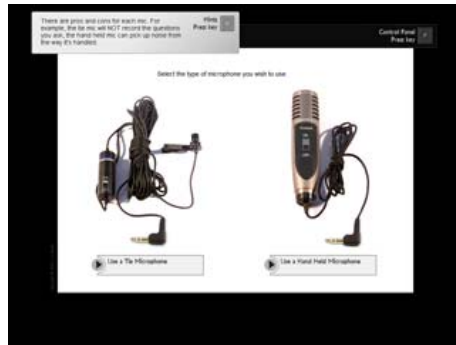
Figure 111 RecordingCoach - assisted interview introduction.



(!) *Press 'C' key to continue.*

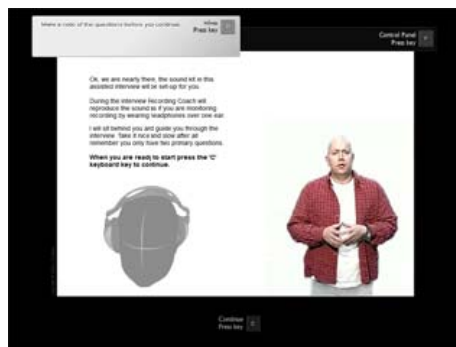
The assisted interview provides the user with an opportunity to try using either a tie microphone or a handheld microphone to record the interview.

Figure 112 RecordingCoach - assisted interview microphone selection.



(!) Select 'Use a tie microphone'.

Figure 113 RecordingCoach - assisted interview preset-up sound kit and headphone monitoring.



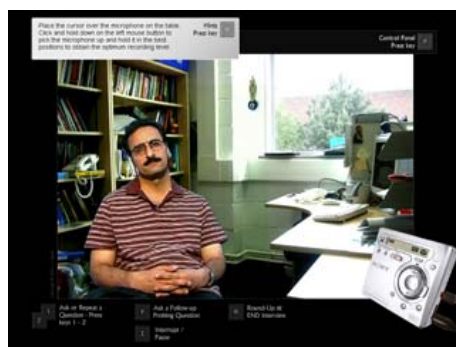
The assisted interview automatically sets up the sound kit and chooses the method of headphone monitoring.

(!) Press to 'C' key to continue.

The coach remains with the user throughout the interview (providing audible guidance in the background).

One of the features of RecordingCoach is the sixty-second timer, which is discussed elsewhere in this element.

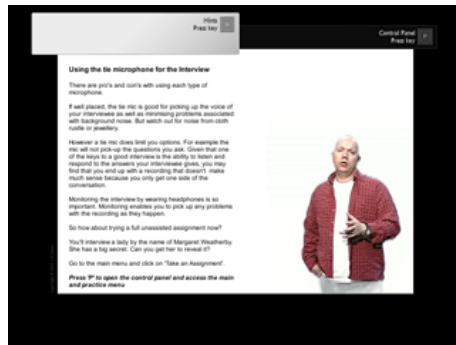
Figure 114 RecordingCoach - assisted interview virtual interviewee.



(!) To see the timer in action, allow 60 seconds to elapse.

The interviewee becomes irritated and terminates the interview. The next screen summarises some of the difficulties of using a tie microphone and suggests to the user that they can either repeat the assisted interview, or move on to the main menu and take a full unassisted assignment.

Figure 115 RecordingCoach - assisted interview summary feedback.



(!) Using the control panel navigate to the main menu (not illustrated here).

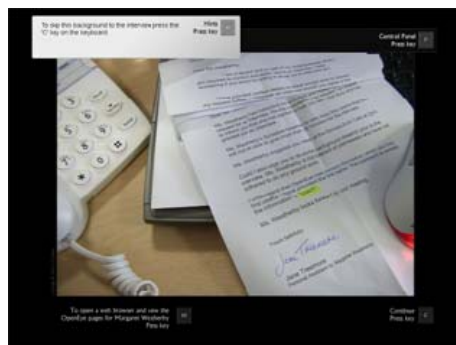
Take an assignment and the introductory sequence

Figure 116 RecordingCoach - main menu link to 'take an assignment'.



(!) From the main menu select 'Take an Assignment'.

Figure 117 RecordingCoach - interview assignment: introduction.



The introductory sequence provides the context of the interview and an opportunity for the user to access the celebrity profile website, which contains the background information about Margaret Weatherby.

(!) Press 'C' on the keyboard to continue.

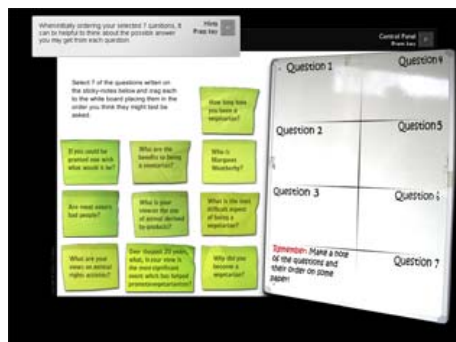
This screen provides the user with an introduction to the following sequence of question selection and arrangements.

Figure 118 RecordingCoach - interview assignment: question selection introduction.



(!) Press 'C' keyboard key to continue.

Figure 119 RecordingCoach - interview assignment: question selection start.



Question selection

The selection and ordering of the post-it notes on the whiteboard dictates the discussion stream (of which there are three) the initial mood state of Margaret, and the possibility of discovering Margaret's secret.

(!) Select the post-it note questions and drag these to the whiteboard as listed below.

It is important that the selection and order is identical to this list:

Q1 - If you could be granted one wish what would it be?

Q2 - How long have you been a vegetarian?

Q3 - What is the most difficult aspect of being a vegetarian?

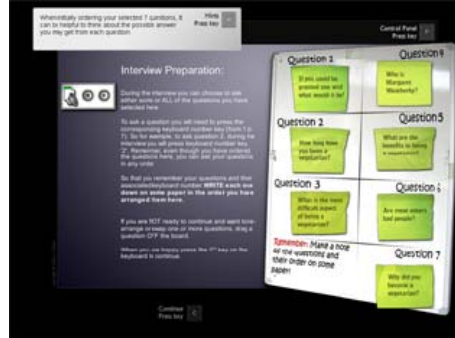
Q4 - Who is Margaret Weatherby?

Q5 - What are the benefits of being a vegetarian?

Q6 - Are meat eaters bad people?

Q7 - Why did you become a vegetarian?

Figure 120 RecordingCoach - interview assignment: question selection finish.



(!) Press 'C' on the keyboard to continue.

The tie mic and introduction to interview controls

Although the choice exists to select either a tie microphone or handheld microphone, only the handheld microphone is fully implemented. Selecting a tie microphone activates a review of the difficulties in using a tie microphone in an interview situation and its use to supplement the handheld microphone.

Figure 121 RecordingCoach - interview assignment: microphone selection.



The following sequence of three screens introduces the user to the keyboard controls used to undertake the interview.

(!) To progress through the next three screens press the 'C' on the keyboard.

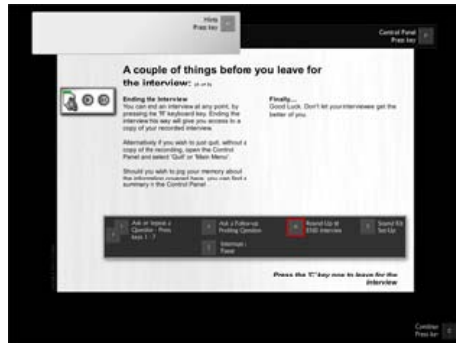
Figure 122 RecordingCoach - interview assignment: introducing the interview controls.



screen 1



screen 2

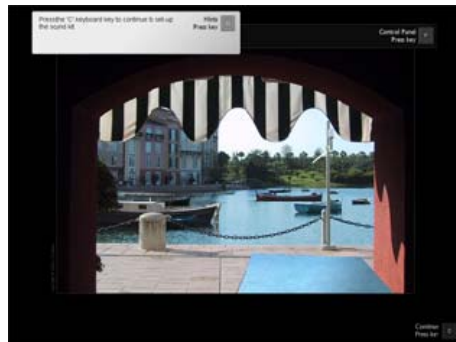


screen 3

The Elmore Dock Café and sound kit set-up

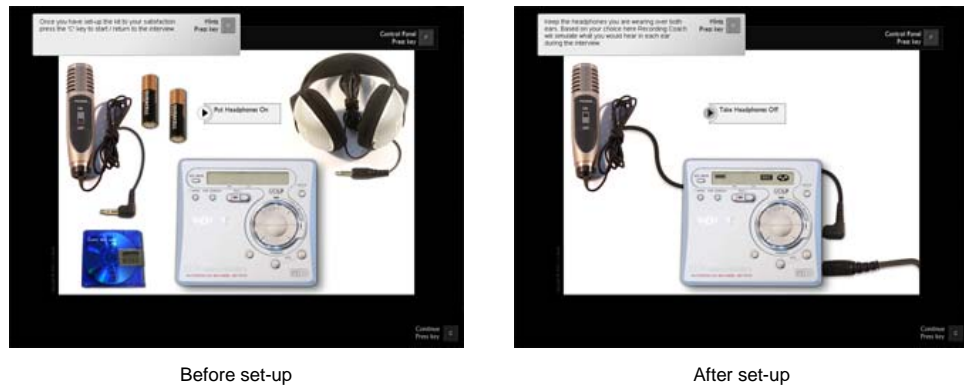
The user arrives at the Elmore dock cafe.

Figure 123 RecordingCoach - interview assignment: arrival at the 'Elmore Dock Café'.



(!) Press the 'C' on the keyboard to continue and set up the sound kit. Make sure the minidisk recorder and microphone are switched on. Also ensure that batteries are both inserted into the minidisk recorder and the microphone; the minidisk is inserted into the minidisk recorder; headphones and microphone are plugged in and headphones put on (headphones should leave one ear uncovered).

Figure 124 RecordingCoach - interview assignment: sound kit set-up.

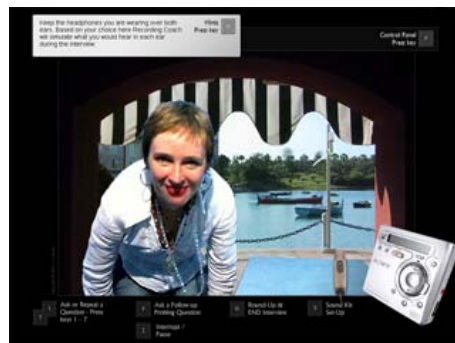


(!) Once the sound kit is set-up, press the 'C' key to continue.

Margaret arrives and holding the microphone

Margaret arrives at the interview and aids the user by suggesting that "the microphone on the table is picked up by clicking and holding down with the left mouse button."

Figure 125 RecordingCoach - interview assignment: Margaret arrives.

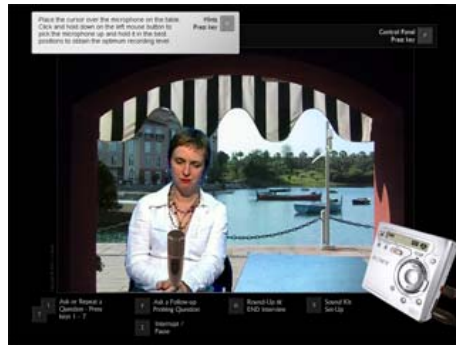


Margaret: "Hello, I see so you hold the microphone by clicking on it and holding down with the left mouse button, ok."

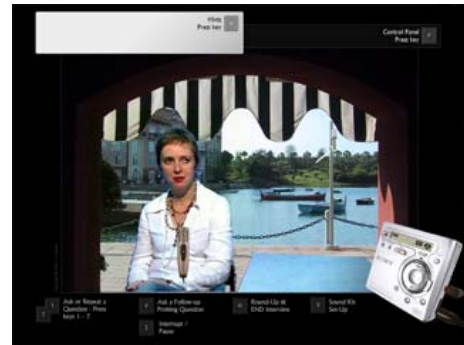
(!) Click and hold down on the microphone with the left mouse button and move the microphone around. Notice the sound distortion generated when the microphone is moved rapidly across the screen.

Throughout the interview, the user must keep the left mouse button pressed to continue holding the microphone. Notice also that the perspective of the microphone shifts, relative to its position on the screen (see Figure 126 below).

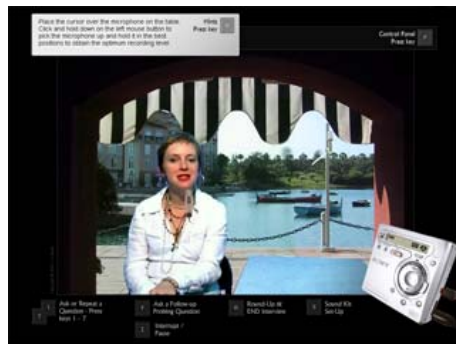
Figure 126 RecordingCoach - interview assignment: hand held mic placement.



(a) Microphone to close to the interviewer



(b) Microphone mid point between interviewer and interviewee



(c) Microphone to close to the interviewee

(!) Manoeuvre the microphone in front of Margaret so that it is vertical (as in Figure 126 (b) above)

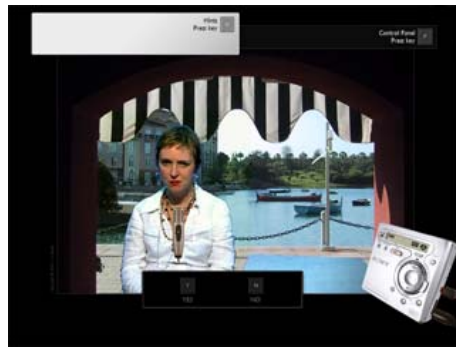
It is important for the time being to keep the microphone correctly placed as this ensures a positive mood state (see 'Margaret Weatherby, unpredictability, questions and answers' in chapter 5).

Reordering and asking questions plus Margaret's research challenge

As already discussed, although questions are selected and arranged by the user, the questions can, during the interview, be asked in any order.

(!) To illustrate this, ask the second question, by pressing the number '2' on the keyboard.

Figure 127 RecordingCoach - interview assignment: Margaret challenges the interviewer about their preparation.



Interviewer: How long have you been a vegetarian?

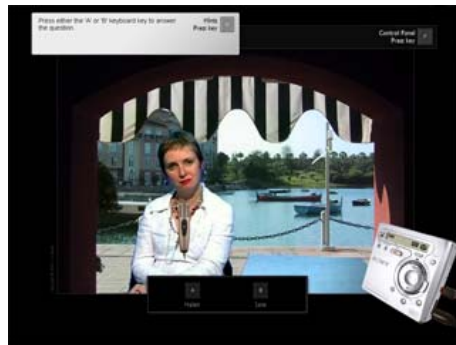
Margaret: A lot of years. Did you do any preparatory research?

Yes or no?

This question elicits a brief response from Margaret who then replies with her own question. "Did you do any preparatory research?"

(!) Answer 'yes' by pressing the 'Y' keyboard key.

Figure 128 RecordingCoach - interview assignment: Margaret tests the interviewer.



Interviewer: Yes

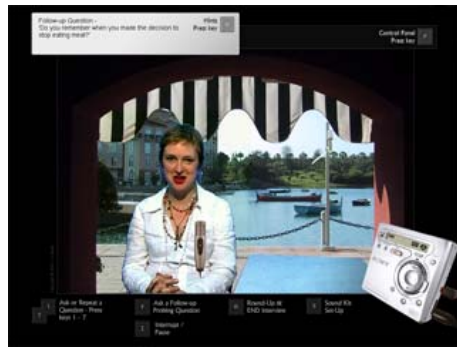
Margaret: Alright so what is my middle name then?

A - Helen or B- Jane?

If you answer 'no' Margaret will walk out in disgust. Margaret challenges your affirmative response by asking a question "Alright so what is my middle name?" a question that can only be answered having visited the celebrity web site. The site can be accessed at <http://www.open-eye.co.uk> the password is 'coach'. However for the sake of convenience the answer is provided here (See Figure 35, chapter 6 for an example of the website).

(!) Answer 'Jane' by pressing the 'B' on the keyboard.

Figure 129 RecordingCoach - interview assignment: Margaret praises the interviewer's knowledge of her.



Margaret: Not many people make a note of this. Well done!

Margaret praises the interviewer for their diligence.

Follow-up questions

(!) Now ask question one again by pressing the number '1' on the keyboard.

Margaret finally provides the answer to the question. Notice in the hints pane, the possible follow-up question. "Why this wish?"

Figure 130 RecordingCoach - interview assignment: follow up questions part 1.

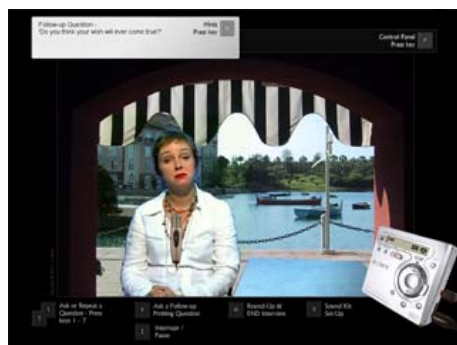


Interviewer: If you could be granted one wish what would it be?
Margaret: I'd wish we were all vegetarians

HINTS PANE
Follow up question: Why this wish?

(!) Ask the follow-up question, by pressing 'F' on the keyboard.

Figure 131 RecordingCoach - interview assignment: follow up questions part 2.



Interviewer: Why this wish?
Margaret: It's how I feel and what I would want.

HINTS PANE
Follow up question: Do you think your wish will ever come true?

A further follow-up question appears in the hints pane. "Do you think your wish will ever come true?"

(!) Ask this second follow-up question, by pressing 'F' on the keyboard.

Figure 132 RecordingCoach - interview assignment: follow up questions part 3.



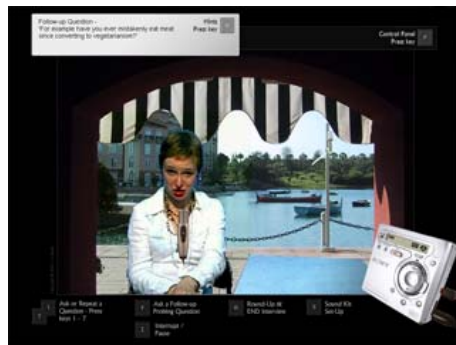
Interviewer: Do you think your wish will ever come true?
 Margaret: We will have to wait and see. Unless you know something I don't?

HINTS PANE
 Follow up question: Have any of your wishes ever come true?

It would be possible to ask two further questions before Margaret stormed out. But we shall move on.

(!) Now ask question three by pressing '3' on the keyboard.

Figure 133 RecordingCoach - interview assignment: Margaret's mood begins to improve.

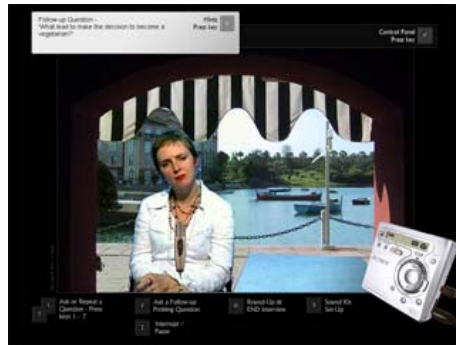


Interviewer: What is the most difficult aspect of being a vegetarian?
 Margaret: Your question assumes there are difficulties. Well there are none. It's a healthy and above all; moral lifestyle. I have difficulty in understanding people's persistence in eating meat given the facts.

You may have noticed that Margaret's mood state has become a little more positive. (This will only be true if you have maintained the microphone in the correct, vertical position as illustrated in Figure 126 (B). Now, while Margaret is in a positive mood state, we attempt to get Margaret to reveal her secret 'why did she become a vegetarian?' This is the parallel goal to securing a successful interview, as discussed in chapter 5 'Margaret's secret, the Easter egg and goals'.

(!) Press '7' on the keyboard to ask the seventh question.

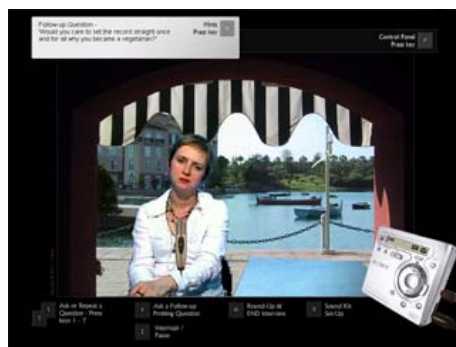
Figure 134 RecordingCoach - interview assignment: probing Margaret about her secret, part 1.



Interviewer: Why did you become a vegetarian?
 Margaret: If you take the time to look at the facts there is no other choice.

(!) Press the 'F' keyboard key to ask the first follow-up question.

Figure 135 RecordingCoach - interview assignment: probing Margaret about her secret, part 2.

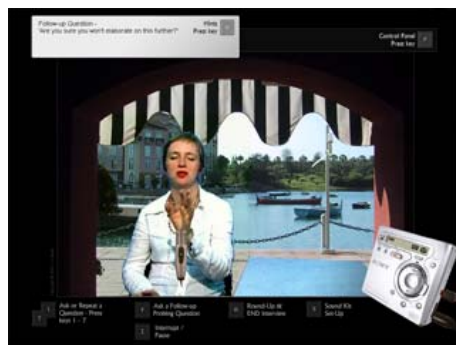


Interviewer: What led you to make the decision to become a vegetarian?
 Margaret: I have answered that question lets move on.

At this point Margaret protests and suggests to the user that they ask another question. A number of these protesting sequences are used within the interview to curtail the need for a large number of follow-up questions. In all instances Margaret protests twice in succession and on the third attempt to solicit an answer (by asking yet another follow-up question) she walks out.

(!) However we will ask a second follow-up question. To do this press 'F' on the keyboard.

Figure 136 RecordingCoach - interview assignment: probing Margaret about her secret, part 3.



Interviewer: In Open Eyes review of your recently released autobiography it says... 'Margaret does not discuss her conversion to Vegetarianism. Only time will tell if she will reveal her secret'.Why did you become a vegetarian?

Margaret: Have you ever seen an animal slaughtered? Worse still have you ever seen animals waiting to be killed. Heard, no, listened to them as they wait in line? I have- they pray! As sure as I have understood all your questions, I heard the words they utter as they wait their fate.
 Now just think.....

The script has been shortened here, but Margaret reveals her secret.

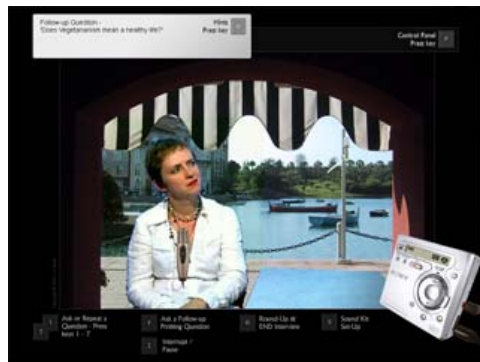
Mic distortion and background noise

To illustrate microphone distortion audibly, when you ask the next question, move the microphone so that it enlarges and points towards you (see Figure 126 (A)). When Margaret answers the question, move the microphone towards her, so that the microphone becomes small and pointing in her general direction (see Figure 126 (C)).

Before you ask the next question and experience the microphone noise, another important element of SRIT skills is monitoring background noise. To illustrate this during the next sequence the sound of a car alarm can be heard.

(!) Now ask question five by pressing '5' on the keyboard. Remember to position the microphone towards you as the question is asked and towards Margaret as she answers.

Figure 137 RecordingCoach - interview assignment: a car alarm sounds.



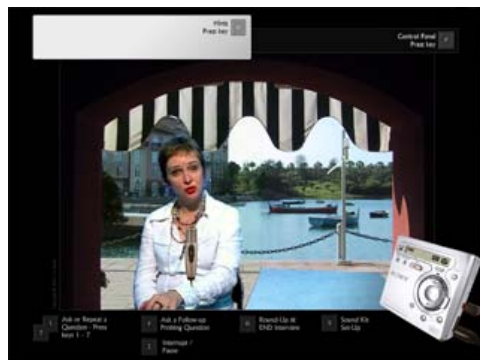
Car alarm is sounding in the background

Interviewer: What are the benefits of being a vegetarian?
 Margaret: Vegetarianism is a life-changing experience.

To stop the car alarm the user must press the 'I' keyboard key and interrupt the interview. If the user fails to do this the car alarm will continue throughout the remainder of the interview. (Identifying the problem makes the problem go away.)

(!) Press 'I' on the keyboard to interrupt the interview.

Figure 138 RecordingCoach - interview assignment: pausing the interview until the car alarm stops.

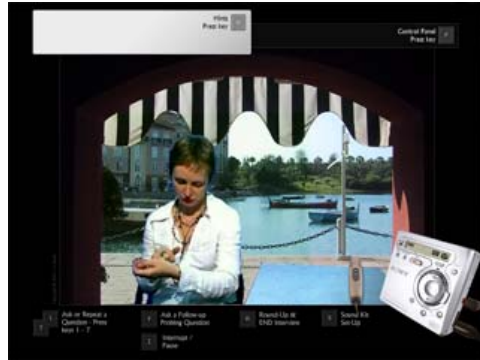


Interviewer: Could we stop a moment, the microphone is picking up that noise?
 Margaret: Ok,....It seems to have stopped.

As previously mentioned two 'Easter Eggs' have been included (see chapter 5 'Margaret's secret, the Easter egg and goals'). To see the 'Easter Eggs' we need to get Margaret to walk out.

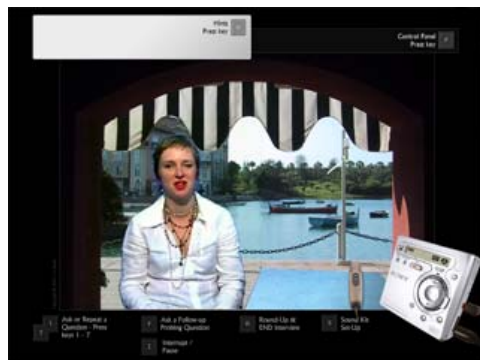
(!) Release the mouse button holding the microphone.

Figure 139 RecordingCoach - interview assignment: dropping the microphone.



The microphone returns to the table top and a clatter can be heard as it drops to the table. After 60 seconds Margaret protests and storms out.

Figure 140 RecordingCoach - interview assignment: Margaret storms out.



Margaret: I have had enough. This is ridiculous!

At this point, the user would normally rounds-up at the interview by pressing 'R' on the keyboard. If however this is not pressed, after a further 60 seconds the first 'Easter Egg' is triggered. The coach appears in the doorway offering condolences and encouraging suggestions to the user.

Figure 141 RecordingCoach - interview assignment: the first 'Easter Egg'.



Coach: Ah, bad luck. True to form she has walked out on you. Press the 'R' key to round-up and retrieve your interview recording. (As the coach walks off) Yes I'm coming.

If the 'round up' key is still not pressed after 30 seconds the second 'Easter Egg' is triggered.

Figure 142 RecordingCoach - interview assignment: the second 'Easter Egg'.



Coach: Seriously she's not coming back. You are going to need to book another appointment if you want to interview her some more. By the way did you get her to reveal her secret? No? Press the 'R' key to round up.

(!) After the second visit from the coach, press, the 'R' keyboard key to round up.

Interview debrief

At the conclusion of each interview, a review takes place. The user is informed whether or not they were successful in setting up the sound kit. The review also provides information to the user about the location of the sound recording (if the sound kit was correctly set up), and asks the user if they have managed to get Margaret to reveal her secret and further challenges the user to discover this.

Figure 143 RecordingCoach - interview assignment: debriefing.



(!) Press 'P' on the keyboard to open the control panel. Use the mouse to select and confirm quit (not illustrated here).

The closing sequence includes the music box rendition 'la vie en rose', the inclusion of which is discussed in chapter 5 p.138.

Figure 144 RecordingCoach - credits and 'la vie en rose'.



Mood state and the different paths

To best illustrate the impact of mood state (caused by incorrect mic placement and other user performance factors) on the interview experience, repeat the above walkthrough (interview section) and keep the microphone in Margaret's face. Her mood state will deteriorate which in turn will alter her responses to the questions and she will not reveal her secret. You can further explore RecordingCoach by selecting different questions and or reordering them during the interview preparation sequence. By doing so this will give you access to the three separate discussion streams. (Element 5, section 2.3 of the script contains information on which questions will activate each of the three discussion streams.)

Retrieving your recording

If you managed to setup the sound kit correctly and placed the recorder into record mode, a copy of your interview recording will now be located at the root of your computer 'C drive', and can be identified by the name you typed in during the RecordingCoach log-in. If you neglected to type anything when asked at the log-in screen, the file will have been given the name 'interview'.

Element 8 - RecordingCoach - Installation and system requirements

How to install and run

PLEASE READ THE INSTRUCTIONS BEFORE YOU INSTALL AND RUN RecordingCoach.

- 1) Copy the "RecordingCoach" FOLDER on the CD to the PC hard drive.
(RecordingCoach will not run on the CD properly). The folder contains hidden files so the FOLDER and not just the contents must be copied.

- 2) RecordingCoach has been designed to be used with headphones only.
PLEASE NOTE. Automatic system volume adjustment at start-up has been disabled. Take care to adjust the PC volume to a comfortable level BEFORE you run RecordingCoach.

- 3) The monitor/screen resolution should be set to 1024x768

- 4) NOTE: Each time RecordingCoach runs it requires online authentication. To achieve this, the PC must have an internet connection. Authentication accesses files stored on a web site. If this site is inaccessible, authentication can not take place and RecordingCoach will NOT operate.

- 5) When asked to input a Student Number, put in your first name. (This will be used as the file name for your interview recording.)

- 6) At the end of the 'Take ans Assignment' section, contrary to the on screen information, copies of the interview recordings are saved on the root of your computers 'C' Drive. (If files can not be saved to 'C' drive this may cause the programme to stop working during the 'Take an Assignment' section of the programme.)

- 7) RecordingCoach is a bespoke design and was originally configured to run on a specific cluster of PCs. In this version, automatic volume control has been disabled as have a number of features which document usage. Also recorded files are located differently. (See point 6 above).

System requirements

A computer running either Microsoft Windows XP or Microsoft Windows 2000 OS.

(A Mac version is not available at the moment.)

- 620MB of free HD space to copy RecordingCoach onto.
- 512 RAM / Sound card / Headphones
- Internet connection
- The ability to write to the computers root or 'C' drive is needed to save the audio recording.

To use RecordingCoach you must also have Apple QuickTime installed on your computer. This can be downloaded and installed free of charge go to: <http://www.apple.com/quicktime/>

Disclaimer

RecordingCoach is provided for evaluation only, as such it is made available "AS IS" without warranty or support.

Every effort has been made to ensure the stability of the software, however by using RecordingCoach you accept the author cannot be held liable for any loss or damage to data or systems that may occur from its use.

If you do not agree to the above DO NOT run the programme.

Element 9 - RecordingCoach CD-ROM

Before you use RecordingCoach, please read the installation instructions, system requirements and disclaimer under element 8 above.